DOCUMENT RESUME

ED 228 210 SP 022 065

TITLE	Peace Corps Stateside Teacher Training for Volunteers in Liberia. Volume IV: Training Program for Secondary School Teachers (Group C). Final Report.
INSTITUTION	PSI Associates, Inc., Washington, DC.
SPONS AGENCY	Peace Corps, Washington, D.C.
PUB DATE	12 Feb 82
CONTRACT	82-042-1003
NOTE	515p.; For related documents, see SP 022 062-066.
PUB TYPE	Guides - Classroom Use - Guides (For Teachers) (052) -- Reports - Descriptive (141)
EDRS PRICE	MF02/PC21 Plus Postage.
DESCRIPTORS	*Cross Cultural Training; Curriculum Guides; English Curriculum; Foreign Countries; Health Education; *Inservice Teacher Education; Instructional Materials; Overseas Employment; Secondary Education; Secondary School Mathematics; Secondary School Science; *Secondary School Teachers; Voluntary Agencies; Volunteers; *Volunteer Training
IDENTIFIERS	*Liberia; *Peace Corps Stateside Teacher Training Model

ABSTRACT

The Peace Corps stateside training program for secondary school teachers in Liberia trained 37 volunteers in several subject area groups--language arts, mathematics and science, and health. Because many of the teachers had never taught before, their 4-week training program concentrated on teaching and learning theories and specific teaching skills/techniques, on sharpening content skills, and on opportunities for practice teaching. Week 1 was devoted to workshops on teaching theory and general teaching techniques. During week 2, teachers were divided up into specific content areas. Week 3 saw the teachers working in District of Columbia Public Schools as student teachers, using lesson plans they had developed. The final week of the training program was used for skills refinement, simulated teaching experiences, and evaluation. Included in this document are many of the resource materials the volunteers received. Present are such items as Liberia's secondary school curricula for English (complete with aims, objectives, and syllabus), mathematics, and science. (JM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED228210

FINAL REPORT

PEACE CORPS STATESIDE TEACHER TRAINING FOR VOLUNTEERS IN LIBERIA

VOLUME IV: TRAINING PROGRAM FOR SECONDARY SCHOOL TEACHERS (GROUP C)

PSI ASSOCIATES, INC.
1900 L STREET, N.W.
SUITE 301
WASHINGTON, DC 20036

CONTRACT NO. 82-042-1003

FEBRUARY 12, 1982

SP 022 065

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☒ Minor changes have been made to improve reproduction quality.

● Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

TABLE OF CONTENTS

GROUP C: TRAINING PROGRAM FOR SECONDARY SCHOOL TEACHERS

PAGE

Introduction 1

Process and Procedures 1

Summary 4

Annex A: Group C - Training Syllabus

Annex B: Volunteer-Made Materials

FINAL REPORT

GROUP C: TRAINING PROGRAM FOR SECONDARY SCHOOL TEACHERS

Introduction

Thirty-seven of the seventy-seven Peace Corps volunteers were assigned to Group C. These individuals were given the positions of secondary teachers and were further subdivided into subject area groups - Language Arts, Math and Science, and Health. All individuals had earned at least Bachelors degrees in their specific fields, some had earned Masters' Degrees. While a few persons were experienced teachers, many had never taught. Consequently, the curriculum had to focus on teaching and learning theories and specific teaching skills/techniques, on sharpening content skills, and on providing the volunteers with opportunities for practice teaching. Since many of the volunteers were very young and very inexperienced, it became necessary to give the extra pat on the back, and to provide moral and emotional support on an as needed basis.

The Peace Corps volunteers were eager and willing to learn. However, they were extremely anxious to get to Liberia and begin teaching. Consequently, it was initially difficult for them to understand the purpose and subsequent personal value of the training. For the most part, however, they demonstrated a real committment and perseverance.

Process and Procedures

The first week of the training was devoted to teaching theory and general teaching techniques. Topics presented were communication and interpersonal relations; instructional objectives; classroom management; developing learning packages; cognitive styles; teaching theories; assessment and use of indigenous materials. Additionally. a practical workshop on Teaching Functional Reading was presented.

The above mentioned workshops were presented to all Group C members. The thinking was that the planned content was necessary for all individuals who were planning to function as teachers. In presenting the material, the staff used a variety of teaching techniques and instructional methods. Those Peace Corps volunteers who were experienced teachers and who demonstrated maturity and leadership ability were utilized as peer trainers to lead small groups. Lectures, discussion, question and answer segments, small group sessions, and individual exercises were the instructional methods used. Audio-visual aids were used as teaching supplements.

On the first day of the training, the PCVs were asked to complete a pre-test which consisted for ten questions based on the planned content. Adjustments in content and emphasis, based on the results of the pre-tests, were made. Throughout the session the participants were encouraged to express their concerns and needs. Trainers made constant changes in an attempt to meet the expressed needs of the participants.

The second week of training was content specific. The trainees worked with UDC instructors in their specific content areas - Math, Science, Language Arts, and Health. Metro buses were chartered to transport the volunteers to the UDC campus. The planned curriculum was good and was designed to refine and refresh content area skills. Some time was lost because of the severe winter weather that plagued the Washington area during that week. Despite this fact, most of the UDC Instructors were able to cover all items on the syllabus quite adequately.

The volunteers were required to work in D.C. Public School classrooms and function as student teachers for a few days during the third week of training. In partial fulfillment of course requirements, the trainees were requested to teach a class following the lesson plans they had developed. Again, the DC area was fraught with inclement weather, and schools were closed for a couple of days. While all of the trainees were able to observe and assist in classrooms, some did not get a chance to teach. This was somewhat problemmatic because so many of the PCVs had no previous teaching.

The PSI trainers adjusted their planned schedule for the fourth week to build in ample time for simulated teaching experiences. While this was adequate and served a very necessary purpose, it was not the ideal situation. In the future, trainees should be given more time for practice teaching, i.e., two weeks in the mornings with afternoons devoted to follow-up and specific content training, for example. The instructors should conduct the training at the "home base" as much as possible to avoid problems presented by bad weather.

The fourth and final week of the training was devoted to skills refinement, simulated teaching experiences, follow-up and evaluations, completion of projects, and closure. The quality of the majority of the learning packages and secondary projects indicated that the PCVs had acquired a wealth of information and skills from the training. In addition, the experienced teachers were able to refresh and refine their skills.

Summary

While many, and perhaps all, of the PCVs still have a lot to learn, the training ended with the feeling that the majority of them were better qualified to teach. After all, teaching is, at least partly, a learning process. At the end of the training, the trainers questioned the ability of three or four individual PC volunteers to teach and to adjust to another culture. The questions were based on the fact that the individuals lacked a sense of responsibility and emotional maturity - characteristics that are important for good teachers. These comments were included in the individual final evaluation reports sent to the in-country training team, to facilitate the next state of training.

ANNEX A

PSI ASSOCIATES, INC.
WASHINGTON, D. C.

TRAINING SYLLABUS

U.S. STATE-SIDE TRAINING FOR
PEACE CORPS VOLUNTEERS FOR:
LIBERIAN EDUCATIONAL INSTITUTIONS

JANUARY 4 - 31, 1982

_____ GROUP A: UNIVERSITY TRAINEES (GREEN)
_____ GROUP B: VOCATIONAL INSTRUCTORS (BLUE)
__X__ GROUP C: SECONDARY SCHOOL TEACHERS (YELLOW)

SI

[illegible] N.W.
Washington, D.C. 20036

(202) 659-6436

DIRECTORS:
Dr. Elizabeth A. Abramowitz
President
Dr. Evelyn P. Boyer
Vice President
Dr. Charles Sanders
PSI Management Development Institute
Dr. Bernard Coleman
PSI International Division
ADVISORY BOARD:
Dr. James Bayton
Professor Emeritus
Howard University
Dr. Kenneth B. Clark
Clark, Phipps, Clark and Harris
Dr. Mamie P. Clark
Northside Center for
Child Development
Mrs. Roscoe Dellums
ostick Productions
Dr. Heidi Dulay
Bloomsbury West
Dr. Roselyn Epps
District of Columbia
Department of Human Resources
Dr. Robert Green
Michigan State University
Dr. Anne Poussaint
Boston Clinic
Dr. Frances Rankin
Howard University Medical School
Dr. Barbara Smith
University of the District of Columbia
Dr. Rosa Trapp-Dukes
Howard University
Center for the Study of
Handicapped Children
Mr. M. Julian West
Children's Hospital National
Medical Center

P.O. Box 1445
US/AID
Monrovia, Liberia

December 24, 1981

Dear Peace Corps Volunteer:

Welcome to a situation where your personal input may make a tremendous impact. You are doubtlessly committed to the assignment. We wish you the success you deserve as you enter the field of human services in Liberia. We wish you success in sharing your knowledge, experiences and outlook on life with the teachers and students in Liberia.

Liberia, as you have been told and will have re-emphasized, is a developing country. There are many areas in this development where progress is needed, and where inhabitants are eager to come up to modern ways of doing things and of making a living.

A large part of your success will be based on how quickly you make the adjustments, which you assuredly must make to be effective in Liberia. Here are some areas of adjustments to remember:

- One adjustment you will face is when you first leave the plane. The heat is intensive. This coupled with the humidity can be frustrating and quite debilitating, if one is too eager to "get moving." When you arrive, it will be the "Dry Season." During this season, very little rain falls and the sun is extremely hot. Rushing around in the direct rays of the sun can be injurious. If you are careful, these injuries will be minimized. You will probably wonder at the way the indigenous people dress. They are more adjusted to the sun and, therefore, appear less concerned with the effects. However, your careful movements now will help you avoid problems later.

- Another area of adjustment for early consideration by you is the use of drinking water. Many times the effect of dehydration leads to a desire for a drink. It is recommended that you avoid water which has not been treated, i.e., boiled and/or filtered. You may eventually be adjusted based on the location of your work. During your health lectures, you may be instructed on chemicals to put in the water. This will help to reduce the possibilities of an upset stomach from the use of water delivered from the pipes. Be warned; care is extremely important.

- The next area for your consideration is your personal protection from mosquitoes. There is a prevelance of malaria in most areas of Liberia. Using repellants and taking your malaria suppressants will reduce the incidents of contracting this fever.

There are other areas which should claim your attention in the early part of your tour:

- You may be assigned to remote areas of the country. Living conditions are somewhat different in the interior than in the capital city, Monrovia. There are problems in Monrovia, but they are magnified in the interior. Access roads are non-existent in some areas; electricity has not reached some areas (and that which has reached is not necessarily dependable.)

- Foods you may desire regularly may be not easily available. Your adjustment to these conditions may take some effect on your part. (Rice is the staple in the Liberian diet.)

- Liberian people are friendly and outgoing. They are eager to have your assurance that there are ways of improving their situations. You will probably be welcomed by individuals who will desire to be "adopted" by you immediately. Be careful because this may be the beginning of a series of "gifts/loans" which you may not be able to easily stop. We recommend that you return "friendly" attitudes, even as you say "no," less you lose a worthy resource.

- There undoubtedly are many times where your personal attributes will serve you well. Use them to your advantage.

- One final suggestion - begin carefully in your zeal to amass the indigenous art pieces. They are interesting, well accomplished but expensive. Bide your time and you will soon learn the art of bargaining.

You will be told during your orientation about the peculiar characteristics of Liberia you will experience. One of these pertains to the political/economic situation in the country. Do not attempt to argue your political (or religious) ideas, or judge the situation in Liberia. You have a job of technical assistance, and need not hamper your cooperative efforts by delving into the political arena. The military rule is designed to change the conditions of Liberia and her people. Let them accomplish this assigned tasks. Liberia relies heavily on international donors, especially the United States. There is, however, some anti-American sentiment, among the nation's leaders. Do not take such comments personally. Do not enter into political debates on the subject. Your effectiveness is the best argument that can be made in defense of the United States.

You represent many disciplines with many years of training and experiences. These will be brought into focus as you take up your teaching stations throughout the country. You will have difficulty and personal frustration, if you attempt to change everything you see immediately. The Liberian people have survived for long time, doing things "their way." Some of your ideas may not necessarily fit unless you adjust your thinking. You, as educators, must be able to utilize some of the ideas and methods you will meet in Liberia. You must be willing to integrate the Liberian way into your own plan of operation.

Finally, let your service be one of growth for the Liberian people in your assigned area, and you too will grow daily.

The best of luck in your work, and feel free to contact PSI Associates in Monrovia, if we may assist you.

Sincerely yours,

Joseph E. Butcher
Technical Adviser,
PSI Associates, Inc.
Youth-On-The-Job Training Program (U.S. AID)
National Youth and Sports Commission
Monrovia, Liberia

PSI ASSOCIATES/UNIVERSITY OF D.C. TRAINING OBJECTIVES

1. Each volunteer will design a complete learning package with 90% accuracy to be used in their classroom in Liberia. (3 weeks).

2. Each volunteer will design two secondary projects -- one in adult literacy -- with 90% accuracy with steps for implementation appropriate to Liberia. (4 weeks).

3. Each volunteer will design and pilot test an in-serivce training package independently for their Liberian counterparts. (3 weeks).

4. Each volunteer will list with 75% accuracy the important cultural traits which will influence how they must operate in Liberia, including the role of women in development. (4 weeks).

PEACE CORPS TRAINING OBJECTIVES

1. Each volunteer will master curriculum development competencies in the subject area relevant to Liberia rural communities.
2. Each volunteer will master secondary project design, competencies and implementation appropriate for Liberia.
3. Each volunteer will master in-service teacher training design and implementation competencies appropriate for peer training in Liberia.
4. Each volunteer will demonstrate sensitivity to the cultural context of Liberia in fulfilling teaching requirements.

REQUIRED TRAINEE PROJECTS

- Classroom Learning Package - Each volunteer will design and develop a classroom learning package in their own subject area. The package will include instructional objectives, teaching strategies, evaluation method, and behavioral indicators of mastery.

- Secondary Projects (2) - Each volunteer will independently design two secondary projects, one in the area of adult literacy. The design will include the goal, the need being addressed, time period covered, materials needed, community resources needed, implementation schedule, evaluation method, and follow-up and monitoring of operations.

- In-Service Training Package - Each volunteer will design and pilot test on another volunteer an in-service training package for their Liberian counterparts. The package will contain the need being addressed, the in-service training goal, the target audience, the training materials and activities, evaluation methods, and follow-up after training.

COMPETENCIES FOR JOB PERFORMANCE: GROUP C

GROUP C: Secondary School Teachers	SUBJECT MATTER UPGRADING (COMPETENCIES)	TRAINING ACTIVITIES
	1. Write grade school curricula using indigenous materials and Liberian classroom organization.	1. Develop an instructional package with instructional objectives, classroom activities, criterion performance, lesson plan, and evaluation methods.
	2. Introduce creative teaching techniques to classroom teaching in the subject area.	2. List creative classroom activities to introduce and reinforce learning. Discuss how to introduce them in the least disruptive way.
	3. Perform routine classroom teaching, evaluation, and planning activities.	3. Role play, microteaching, and exercises in writing lesson plans, keeping student records, evaluating student progress, and managing a classroom.
	4. Conduct needs assessment to identify realistic secondary projects for the school and the community.	4. Design 2 secondary projects, one emphasizing adult literacy. Develop a list of possible secondary projects. Conduct practice needs assessment using the local D.C. community.
	5. Conduct in-service training workshops for Liberian teachers.	5. Plan in detail an in-service training workshop which uses indigenous Liberian materials and responds to Liberian teacher training needs in the subject area. Demonstrate how workshop will operate.

GROUP C: Secondary School Teachers (Cont'd)	SUBJECT MATTER UPGRADING (COMPETENCIES)	TRAINING ACTIVITIES
(School Health)	6. Develop curricula in school health based on nutrition and health care needs of Liberia, including hygiene, family planning, and disease control.	6. Read, participate in informal lectures, films on school health. Develop instructional package for students in Liberia.
(Language Arts)	7. Conduct classes using English-as-a-Second-Language (ESL) teaching techniques.	7. Observe, read, demonstrate ESL techniques. Practice ESL instructional techniques appropriate for Liberian secondary schools.
"	8. Develop ESL curricula in curricula in language arts.	8. Develop and implement in the classroom, ESL curriculum - an instructional package.
(Science/ Math)	9. Plan and implement a series of in-service workshops for Liberian teachers in these areas.	9. Design and pilot test an in-service training program for Liberian teachers using other volunteers. Conduct micro-teaching sessions.

HOW THE SCHOOL SYSTEM WORKS IN LIBERIA

Prepared By: Mr. Joseph E. Butcher
PSI Associates, Inc./
Monrovia, Liberia

Most schools in Liberia are under the jurisdiction of the Ministry of Education. Teachers are hired, and then assigned to the various districts by the Ministry. Some nepotism enters into these assignments.

Supervision is left to the local school level. Superintendents vary widely in competence as administrators and as educational leaders in the district. Their appointments are also done by the Ministry of Education.

Supplies and materials are scarce, especially in the interior. Books are purchased by the students on the open market. Books are very expensive and often seriously out of date. American textbooks are used extensively. There is a tremendous need to supplement the texts with teacher-made learning activities packages.

There are some consolidated school districts. The largest is the Monrovia Consolidated School System which operates the public schools in Monrovia. In addition to the academic schools, there are vocational schools. These secondary schools prepare students for skilled trades jobs in industry. Most large employers supplement the school vocational training with their own on-the-job training programs. Many excellent vocational teachers work in these private vocational training programs.

Private schools are generally better run and more highly regarded as educational institutions, than are public schools in Liberia. Private schools charge tuition, which in some cases is very high. Private school students as a group perform better than public school students on the National Exams. These scores are important for college training.

The Ministry of Education has as a stated goal -- to improve the public school curricula. This reform has been extremely slow because of lack of qualified teachers, and lack of money to institute large scale reforms.

The guidance and counseling programs are extremely weak. Students rely on family tradition, family contacts, and peers in deciding what educational path to follow.

Instruction relies heavily on rote methods of training. Some audio-visual equipment is available. But, there are few teachers trained in producing the types of audio-visual products the students need. Unfortunately, there are instances where the audio-visual equipment is simply stored in the school, and allowed to deteriorate in the humidity.

In general, if one were to assess the instructional program in Liberian public schools, it might be as follows:

- Math Training .... Low
- Reading Training .... Low
- General Comprehension .... Low
- English Language .... Fair
- Vocational Training .... Fair

There is one large state university -- University of Liberia -- located in Monrovia. The demand for places far exceed the capacity of the institution.

Like all Liberian ministries, the Ministry of Education has very little money to work with. It relies heavily on international donors, such as U.S. Agency for International Development, Peace Corps, World Bank, and other countries, such as Germany, Libya, and Japan for assistance.

The current government came to power through military take-over in April 1980. The current government has publically stated its determination to eradicate illiteracy and to improve the quality of life in the interior. The Ministry of Education's mission is, in part, to improve schools in the interior. The Peace Corps provides a significant cadre of teachers to work in the interior as a part of this mission.

OVERVIEW OF WEEK 1

Week 1:

(a) Orientation to Washington, D.C. and the training program, and health screening by National Medical Association Foundation Plan, Inc./ Shaw Community Health Center.

(b) Evaluation of teaching competencies (adapted from list of teach competencies developed by Ohio State University National Center for Vocational Education).

(c) Teacher training introduction and review.

(d) Cross-cultural training (including child health and nutrition needs).

(e) Secondary projects - introduction.

Outcomes for Week 1:

Each volunteer will have strengthened their pedagogical skills.

Each volunteer will begin to define their 3-mandated projects.

GROUP C

TRAINING SYLLABUS FOR SECONDARY SCHOOL TEACHERS

I. Peace Corps Training Objectives

- Each volunteer will master curriculum development competencies in the subject area relevant to Liberian rural communities.
- Each volunteer will master secondary project design, competencies, and implementation appropriate for Liberia.
- Each volunteer will master in-service teacher training design and implementation competencies appropriate for peer training in Liberia.
- Each volunteer will demonstrate sensitivity to the cultural context of Liberia in fulfilling teaching requirements.

II. PSI/UDC Training Objectives

- Each volunteer will design a complete learning package with 90% accuracy to be used in their classroom in Liberia. (3 weeks)
- Each volunteer will design two secondary projects, one in adult literacy, with 90% accuracy with steps for implementation appropriate to Liberia. (4 weeks)
- Each volunteer will design and pilot test an in-service training package independently for their Liberian counterparts. (3 weeks)
- Each volunteer will list with 75% accuracy, the important cultural traits which will influence how they must operate in Liberia, including the role of women in development.

III. Competencies

1. Write grade school curricula using indigenous materials and Liberian classroom organization.
2. Introduce creative teaching techniques to classroom teaching in the subject area.

IV. References, Reading Materials, Etc.

1. Mager, Robert F., Preparing Objectives for Programmed Instruction, 1962.
2. Applied Skills Training Series, Human Relations Development, Applied Skills Press, 1979
3. Gordon, Thomas, Leadership Effectiveness Training.

AGENDA - WEEK I

GROUP C: SECONDARY SCHOOL TEACHERS

LEADERS: Yvonne B. Ali, Ph.D. / Marilyn Goldhammer

DAY 1 - Monday, January 4, 1982

9:00 - 9:10 - Introduction

9:10 - 9:20 - Human Bingo

9:20 - 10:00 - Pre-test (on course objectives for the week)

10:00 - 12:00 - Detailed Review of Course Requirements
  - Learning Packages
  - Community Project
  - In-Service Training Project

12:00 - 1:00 - Lunch

1:00 - 5:00 - Shaw Community Health Center
  - Individual Interviews
  - Self-Evaluation
  - Immunizations

DAY 2 - Tuesday, January 5, 1982

9:00 - 9:15 - Feedback on Day 1

9:15 - 12:00 - Communication Skills
  - Stages of Interpersonal Communication
  - Styles of Communication
  - Active Listening

12:00 - 2:00 - Lunch (PSI/UDC Trainers meeting at lunch)

2:00 - 3:00 - Instructional Objectives: An Overview

DAY 2 (CONTINUED)

3:00 - 3:15 - Break

3:15 - 4:15 - Small group tasks to: Develop instructional objectives

4:15 - 5:00 - Process/share small group tasks

DAY 3 - Wednesday, January 6, 1982

9:00 - 12:00 - Introduction to Curriculum
- Theories of Cognitive Development
- Teaching Styles
- Learning Styles

12:00 - 1:00 - Lunch

1:00 - 2:00 - Introduction to Curriculum (Continued)
- Learning Styles and Motivating students on cultural values

2:00 - 2:15 - Break

2:15 - 4:15 - Functional Reading Skills

4:15 - 5:00 - Evaluation of Training to Date

DAY 4 - Thursday, January 7, 1982

9:00 - 9:30 - Logistical Announcements

9:30 - 12:00 - Assessment of Students
- Pros/Cons
- Developing Informal Assessment Instruments

12:00 - 1:00 - Lunch

1:00 - 2:00 - Assessment (Continued)

2:00 - 5:50 - Classroom Management
- Purpose
- Techniques

DAY 5 - Friday, January 8, 1982

9:00 - 9:15 - Assessment (Continued)
- Development of Subjective/Objective Tests

10:15 - 10:30 - Break

10:30 - 12:00 - Review of Developing Learning Packages

12:00 - 1:00 - Lunch

1:00 - 2:00 - Post-test and Evaluation

2:00 - 4:00 - Lecture in Liberian Education

4:00 - 5:00 - Meeting with UDC staff

OVERVIEW OF WEEKS 2 AND 3

Weeks 2 & 3:

(a) Subject - area upgrading at UDC College of Education.

(b) Practice teaching in inner-city schools.

(c) Continued secondary projects training.

(d) Cross-cultural training.

(e) Mid-project evaluation of volunteers.

Outcomes for Weeks 2 & 3:

Each volunteer will have completed one instructional package to be used in their classroom in Liberia.

Each volunteer will have completed one in-service training workshop for their Liberian counterparts.

University of the District of Columbia
College of Education & Human
Ecology

&

D.C. Public Schools

A Training Workshop
Groups A and C:
Mathematics & Science Teachers

Mini Course on Technical Skills in Mathematics and Science

Instructors: Beverly J. Anderson, Ph.D.
Mildred Lockhart, Ph.D.

Phone: 364-6000

Objectives of Course - The learner will become acquainted with instructional strategies for teaching concepts, processes, etc. in mathematics and science. The learner will also analyze all learning in the mathematics and science classrooms in terms of three sets of characteristics - characteristics of the learner, characteristics of the instructional materials and characteristics of the material to be learned.

The concentration of teachers in Liberia will be in the areas of Mathematics and Reading. The students in this workshop will be prepared to teach mathematics and science in the secondary schools. Mathematics is the language of science and often explains science technology and is the basis of scientific literacy. The theory taught will be related to the development and exposure of the students mathematics and scientific instructional aids

Note: An effective teacher is one who understands thoroughly what is being taught and who sets up learning situations so that each student can learn in the most effective manner.

Students:
This course is designed for prospective secondary school teachers of mathematics and science in Liberia, Africa.

Schedule:
This course is scheduled to meet from 9:00 a.m. - 3:00 p.m., Monday thru Thursday (January 11-14, 1982) and Monday thru Friday (January 18-22, 1982).

Course Requirements:
(a) The student will read and discuss 15 articles on Secondary School Mathematics and Science.

(b) The students will prepare 4 reports on classroom observations.

Report 1. Classroom Environment
Report 2. Behavioral Objectives
Report 3. Learning Activities
Report 4. Assessment Tasks

(c) The student will develop and implement 2 lesson plans.

(d) The student will develop a learning package.
(e) The student will develop a a resource file

Readings in Secondary School Mathematics

Article:

1. Do Teachers Understand Learning Theory?
   C. A. Weber

2. Gagne' on the Learning of Mathematics A "Product" Orientation
   Robert M. Gagne'

3. Bruner on the Learning of Mathematics - A "Process" Orientation
   Jerome Bruner

4. Psychological Controversies in the Teaching of Science and Mathematics
   Lee D. Shulman

5. Peaget on the Learning of Mathematics
   Irving Adler

6. Piaget and Science Education
   David Elkin

7. Goals and Objectives of Mathematics Education
   D. Johnson & G. Rising

8. What Makes a Good Teacher
   Dan Hamachek

9. Why Use Instructional Materials in the Mathematics Classroom
   Donavan Johnson

10. Testing in Mathematics: Why? What? How?
    M. Epstein

11. More on Testing - Some Specific Suggestions

12. "Take Home" Tests
    Florence Elder

13. Formulating Objectives for Elementary Science
    Ronald Anderson

Mager, R. Preparing Instructional Objectives Belmont, California. Lear Siegler Inc., Fearon Publishers, 1973.

PACE SHEET DATE (1982):	TOPIC:
Monday, January 11	Instructional Theories in Mathematics and Science -- Discuss Articles 1-5
January 11-14	Interaction with Instuctional Material
Tuesday, January 12	Developing and Evaluating Instuctional Materials and Teaching Aids -- Discuss Articles 7-8 Interaction with Instructional Material
Wednesday, January 13	Developing Plans, Mager, R. -- Discuss Articles Interaction with Instructional Material
Thursday, January 14	Assessment Techniques -- Read Articles Interaction with Instructional Material
Friday, January 15	Holiday - Martin Luther King's Birthday Read Articles
Monday, January 18	Orientation Session Morning in Public Schools - Tour of Physical Plan Afternoon at 3 Classroom Observation Prepare Report on the Classroom Environment
Tuesday, January 19	Classroom Observations in Public Schools Prepare Report on Behavioral Objectives Prepare Lesson Plan for 1 Class
Wednesday, January 20	Observation Teach 1 Class 1-3 Discuss Learning Package for Thursday Prepare Learning Package for 2 Classes
Thursday, January 21	Observation Teach 1 Class
Friday, January 22	9-11 Teach 1 Class 11-12 Wrap-up Session

Outline For Syllabus

Group C: Secondary School Teachers: School Health

- I. Food Faddism, Weight Control, Food Needs
  - A. Food Faddism
  - B. Weight Control
  - C. Food Needs
    - 1. Employing Dietary Essentials
    - 2. Energy Needs
    - 3. Nutrient Supplements
    - 4. Elements of an Adequate Diet
- II. Alternative Healing Philosophies
  - A. Biofeedback
  - B. Chiropractic
  - C. Faith Healing
  - D. Self-hypnosis
  - E. Meditation
- III. Health Insurance
  - A. General Types of Health Insurance Plans
  - B. Guidelines for Selection of Health Insurance
  - C. Sources of Health Insurance Information
- IV. Health Care Economics
  - A. Personal Health Care Expenditures
  - B. Health Insurance
  - C. Doctor's Fees
  - D. Education

II. Training Objectives

A. To provide health teachers who will teach the new health Curriculum in various schools, while also working with in-service science teachers to help them incorporate health lessons into their own classes.

B. To extend health instructions to parents and others outside the classroom.

C. To develop appropriate health materials for instructional use.

III. Competencies for the Job

The participant should be able to:

A. appraise and demonstrate the ability to communicate health care skills.

B. demonstrate average knowledge relative to health practices.

C. organize and prepare activities with regard to behavioral objectives, instructional activities and ways and means of evaluation.

D. demonstrate adequate knowledge of subject matter.

IV. References/Reading Materials

A. References related to Food and Health

1. Bauer, W.W., editor: Today's Health Guide, Chicago, 1965, American Medical Association.

2. Bray, G.A.: "The myth of diet in the management of obesity", Am. J. Clin. Nutrition. 23: 1141-1148 September 1970.

3. "A common sense look at health foods", Changing Times 26: 25-28, June 1972.

4. Darden, E.: "Sense and nonsense about health foods", J. Home Economics 64: 4-8, December 1972.

5. Geller, S.: "Natural food", School Health Reviews 5: 19, 21, May-June 1974.

6. Grotta - Kurska, D.: "Before you say baloney..." Here's what you should know about vegetarianism, Today's Health 52: 18-21, October 1974.

7. National Dairy Council: "Food Faddism", Dairy Council Digest 44:1, January-February 1973.

8. "The Nutrition risks in a vegetarian diet", San Francisco Chronicle, September 13, 1974.

9. "The organize food debate", San Francisco Sunday Examiner and Chronicle, March 10, 1974.

10. Smith, R.L.: "The bunk about health foods", Today's Health, 43: 27-31, October 1965.

B. Resources

For Nutrition Information Write To:

1. American Dietetic Association
   620 N. Michigan Avenue
   Chicago, Illinois 60611

2. American Home Economics Association
   1650 Twentieth Street, N.W.
   Washington, DC 20009

3. The Nutrition Foundation
   99 Park Avenue
   New York, New York 10016

4. Food and Nutrition Board
   National Academy of Sciences - National
   Research Council
   2101 Constitution Avenue, S.W.
   Washington, DC 20005

C. Reference related to alternative healing philosophies

1. Schultz, T.: "What Science is discovering about the potential benefits of meditation", Today's Health 50: 34-37, April, 1972.

2. American Cancer Society: Unproven methods of Cancer Management, New York, 1971, The Society.

3. Capric, F.S., and Berger, J. R.: Helping yourself with self-hypnosis, New York, 1963, Warner Paperback Library.

4. Carlova, J.: "Even M.D.'s have faith in this faith healer", Medical Economics, September 1973, p.p. 98-101

5. Kime, R.E.: Health: A consumer's dilemma, Belmont California, 1970, Wadsworth Publishing Co., Inc.

6. Lloyd, F.G., and Irwin, G.: "How quackery thrives on the occult", Today's Health 48: 21-23, November 1970.

7. Perlman, D.: "Hypothesis as a tool against pain", San Francisco Chronicle, November 8, 1974.

8. Rorvik, D.: "The theta experience: electronic insight". Saturday Review of the Sciences 1: 46-51, May 1973.

9. Rose, L.: Faith healing, Baltimore, Maryland 1971, Penguin Books, Inc.

10. Sherman, H.: Your power to heal, Greenwich, Connecticut, 1973, Fawcett World Library.

11. "The awful truth about Scientology", The Realist 97B: 1-8, October 1973.

12. U.S. Department of Health, Education and Welfare: Health Resource Statistics: Health Manpower and Health Facilities, 1972-1973, Washington, D.C., 1973, U.S. Government Printing Office.

13. Wilbur, R.M.: "What the health care consumer should know about Chiropractic", J.A.M.A. 8: 1307-1308, February 1971.

D. References with regard to Health Insurance

1. Denenberg, H.S.: A Shopper's guide to health insurance, Harrisburg, 1971, Insurance Department of the Commonwealth of Pennsylvania.

2. Kennedy, E.M.: In critical condition: The crises in America's health care, New York, 1973, Pocket Books,

3. "Mail Order health insurance", Consumer Reports 38: 304-310, May 1973.

4. "Questions you ought to ask", Changing Times, August 1971.

5. U.S. Department of Health, Education and Welfare, Social Security Agency, Office of Research Statistics: Medical Care Expenditures, Prices and Costs: Background Book, DHEW Publication No. (SSA) 74-11909, Washington, D.C., 1973, U.S. Government Printing Office.

6. Warden, K.D.: "Bring your major medical benefits up to $100.000", Medical Economics, August 1974, p.p. 76-78.

E. References With Regard to Health Care Economics

1. Doyle, P.J.: Save your health and your money, Washington, D.C., 1971, Acropolis Books, Ltd.

2. Falasco, R.F., and Henderson, W.G.: "Estimated reduction in dental expenditure for Iowans through prevention programs", J. Am. Dent. Assoc. 86: 627-634, March 1973.

3. Gulick, W.: Consumer's guide to prescription prices, Syracuse, N.Y. 1973, Consumer Age Press.

4. Health Insurance Institute: Sourcebook of health Insurance data 73-74, New York, 1974, The Institute.

5. McKinlay, J.B., editor: Economic Aspects of Health Care, New York, 1973, Prodist.

VI. Course Content

A. Nutrition Facts - Health Related

1. Food Faddism
    - A. Natural, organic, health foods
    - B. Cost of health foods
    - C. How to protect yourself

2. Weight Control
    - A. Diets, types and procedures
    - B. Obesity Clinics
    - C. Appetite Suppressants
    - D. Organizations in diet control

3. Food Needs
    - A. The recommended daily allowance (RDA)
    - B. The basic four food groups
    - C. Vitamins Supplements
    - D. Effects of Overdoses of Vitamins

B. Alternative Healing

- A. Theory Supporting biofeedback
- B. Orgin and use of Chiropractic
    - 1. Types of Chiropractors
    - 2. Professional preparation of Chiropractors
    - 3. Services
    - 4. Rejecting Theory
- C. Faith Healing
    - 1. Christian Science
    - 2. Current Healers
        - A. Katherine Kuhlman
        - B. Oral Roberts
        - C. Olga Worrall
        - D. Following God's Will
- D. Other Health Philosophies
    - 1. Self-hypothesis
    - 2. Meditation

C. Health Insurance

1. Types
    - A. Private prepared fee-for-service
    - B. Basic health insurance
    - C. Major medical insurance
    - D. Disability insurance

2. Benefits

3. Guidelines
    A. Type of Policy
    B. Hospital insurance
    C. Surgical insurance
    D. Medical insurance
    E. Maternity care

4. Resources

D. Health Care Economics
  1. Doctor's fee
  2. Consumer action regarding fees
  3. Drugs
  4. Guidelines for reducing the cost of health care

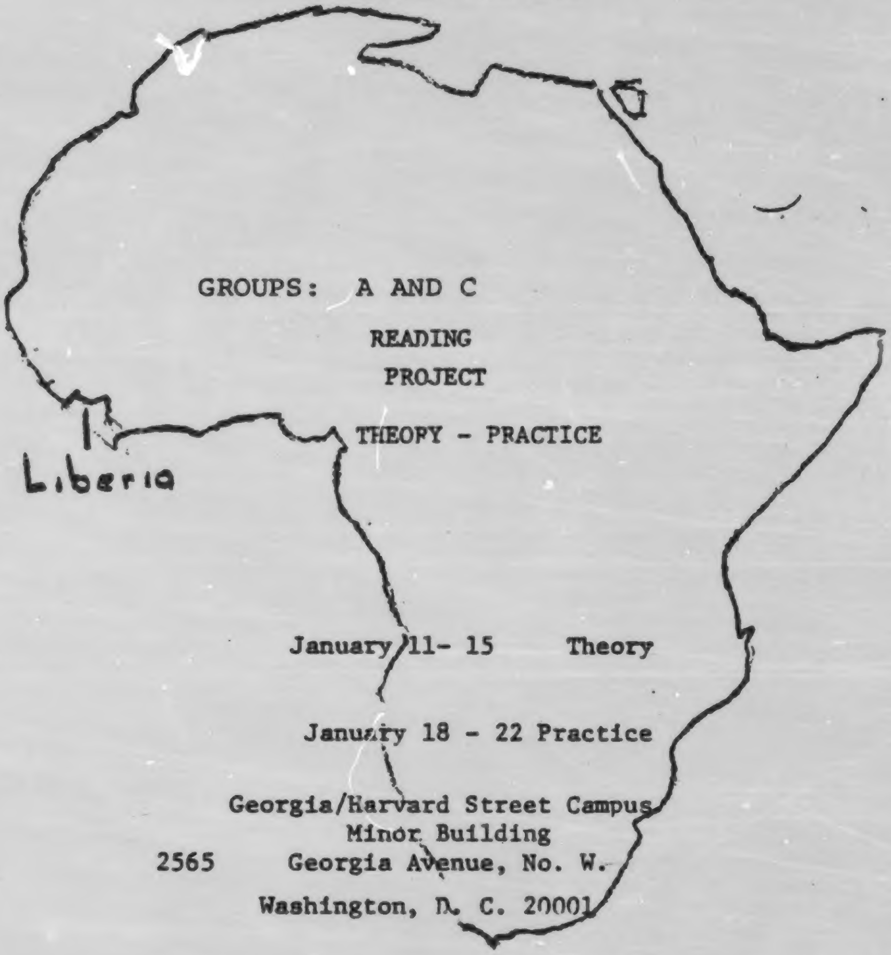
Evaluation

Participants will engage in discussion of each category of topics. These discussions will focus on:

1. Comparisons
2. Contrasting
3. Critizing
4. Describing and/or illustrations, and
5. Relating information to everyday life in simple terms.

University of the District of Columbia
College of Education and Human Ecology
and
D. C. Public Schools
Present

A TRAINING WORKSHOP



GROUPS: A AND C
READING
PROJECT
THEORY - PRACTICE

January 11- 15 Theory

January 18 - 22 Practice

Georgia/Harvard Street Campus
Minor Building
2565 Georgia Avenue, No. W.
Washington, D. C. 20001

Dr. Laura J. Smith
Associate Professor - UDC

INTRODUCTON

The successful teacher, in no matter what country, is one who assesses pupil's strengths, skill needs, modalities and interests, and plans and executes meaningful activities which promote the upward mobility of said pupils from the level identified in the assessment. In reading, there are five major areas: reading readiness, word perception, including vocabulary, comprehension; study skills, and content area skills. This theoretical/practical training workshop provides an opportunity for trainees to sharpen and augment their skills in both diagnostic and prescriptive strategies in all of the areas mentioned.

This experience is designed for prospective secondary trainees to gain both theoretical knowledge and experiential competence in those specific reading methodologies. Performance objectives have been designed in three broad areas: content knowledge, behavioral skills and human relation skills. The design provides a framework for individualized instruction and application of theory to practice.

BEHAVIORAL OUTCOMES

The student/trainees will be able to:

Develop a philosophy of reading as it relates to the content area

Assess pupil's strengths and needs in specific skill areas

Identify the range of reading achievement in secondary schools and demonstrate knowledge of basic constructs underlying a secondary reading program

Develop a variety of classroom strategies for reading in content areas: namely: Reading Study Guides, Directed Reading Activity, Modified Language Experience Approach, Questioning Strategies, Use of Newspapers, Sustained Silent Reading, Contracting, Advanced Organizers, Cloze Games

Demonstrate knowledge of the use of readability formula and ability to utilize at least one of several (Fog, Smog, Cloze, Fry)

Interpret diagnostic instrumaents for teaching to the strengths of pupils

Demonstrate knowledge of planning and implementing content area lessons that incorporate viable reading skills

Demonstrate knowledge and skill to differentiate content material for the diverse learning levels of students

Demonstrate an understanding of the interrelatedness of word analysis skills and comprehension skills and the limitation of word analysis in isolation

Exhibt an understanding of the complex nature of the reading thinking process

Determine instructional strategies to reflect the skills needed by students

Develop and use games, manipulative teacher made devices and activities appropriate for diagnostic teaching

Exhibit knowledge of professional referances

Objectives:

A. Understanding the Need for Reading: Rationale for Place in Secondary School

1. Perceive the role of secondary content teacher as responsible for meeting the needs of his secondary students.
2. Demonstrate orally knowledge of basic constructs underlying good secondary reading programs.
3. List the values of effective functional reading skills for youth and adults.
4. Determine if role perception of incorporating reading methodologies in content areas meshes with per-
5. Analyze reasons for continued reading instruction and guidance in secondary schools.
6. Differentiate in writing a knowledge of developmental, corrective and remedial programs.
7. Demonstrate orally and in writing knowledge of reading research and innovations in content area reading.
8. Identify uses of reading and roles of reading in modern life.

B. Understanding the Meaning of Reading

1. Explain the complex nature of the reading thinking process.
2. Demonstrate an understanding of language learning and thought as they relate to the reading meaning process.
3. List and describe reading skills that are prerequisite to teaching subject matter material: comprehension, concepts, vocabulary, word recognition, reading rate and flexibility, research study skills.
4. Display positive attitudes toward fostering respect for recreational reading as well as informational reading.

C. Understanding the Learner

1. Identify and list educational and non-educational causes of reading disability.
2. Examine personal feelings toward learner who has problems in reading in secondary schools.
3. Evidence knowledge of related psychological, sociological, physiological factors that restrict reading achievement.
4. Show familiarity with techniques for motivating students to want to read and enjoy reading.
5. Exhibit competence and knowledge of interpretation of diagnostic instruments used to determine instructional level.
6. Develop a theoretical and personal knowledge of adolescents and meet them on a professional basis.
7. Prepare informal reading instruments to assess reading interests preferences, strengths and needs of adolescents.
8. Identify and explain techniques for individualizing instruction to meet the needs of learners.

D. Understanding the Appropriate Strategies

1. Demonstrate competence in assisting students with information acquisition: locating, organizing, categorizing and remembering content material.
2. Evidence competence and knowledge of understanding necessary for written reports.
3. Describe and implement a variety of classroom strategies for improving comprehension, concepts, vocabulary and research and study skills: Reading Study Guide, Cloze Procedure, Rewriting Materials, Sustained Silent Reading, Use of Questioning, Chunking, Contracting, Directed Reading Thinking Activity, Games, L.E.A.
4. Demonstrate knowledge of planning and implementation of content area lessons that incorporate viable reading skills.
5. Describe organizable patterns of writing in specified disciplines.
6. Exhibit required qualities of creativity, resourcefulness, humanism and dependability requisite to successful classroom teaching.
7. Assist students in surveying and setting purposes for reading.

8. Exhibit skill in decision making for provision of

E. Understanding the Appropriate Use of Materials

1. Adopt a philosophy about textbook selection and usage in secondary classrooms.

2. Evidence familiarity with wide variety of materials appropriate in secondary classrooms (manuals, workbooks, charts, multimedia, and other supplementary materials.)

3. Demonstrate knowledge of how to calculate the readability level of textbooks in your content area.
4. Demonstrate knowledge and skill to differentiate content material for the diverse learning levels of students.

5. Identify and explain the essential organization structure of a standard textbook series used in the secondary school in your subject matter field.

Resources:

Burmeister, Lou E. Reading Strategies for Secondary School Teachers. Addison Wesley Publishing Co., Reading, Massachusetts, 1974.

Cushenbery, Donald C. Remedial Reading in the Secondary School. Parker Publishing Co., West Nyack, N.Y., 1972.

Dechant, Emerald. Reading Improvement in the Secondary School. Prentice Hall, Englewood Cliffs, New Jersey, 1973.

Dietrich, Dorothy M. and Virginia H. Mathews. (eds.) Reading and Revolution, Newark, Del. The International Reading Association, 1970.

Dillner, Martha H. and Olson, Joanne P. Personalizing Reading Instruction in Middle, Junior, and Senior High Schools. Macmillan Publishing Co., New York, 1977.

Duggins, James. Teaching Reading for Human Values in High School. Columbus, Ohio: Charles E. Merrill Publishing Company, 1972.

Forgan, Harry W. Teaching Content Area Reading Skills. Ohio: Charles E. Merrill, 1976.

Gambrell & Wilson, Robert. Focusing on the Strengths of Children. Fearon Publishing, Belmont, California, 1973.

Gililand, Hap. A Practical Guide to Remedial Reading. Ohio: Charles E. Merrill, 1974.

Hafner, Lawrence E. Improving Reading in Middle and Secondary Schools. Selected Reading, Macmillan Publishing Co., New York, 1974.

Hafner, Lawrence E. (Ed.) Improving Reading in Secondary Schools. Selected Reading, New York: Macmillan.

UNIVERSITY OF THE DISTRICT OF COLUMBIA

READING DEPARTMENT

EVALUTION January, 1982

ACTIVITIES	THEORY	PRACTICUM	DATE OB-SERVED EVALUATION
Word Puzzle - Game			
Study Guide			
Group Participation			
Language Experience A-proach			
Writing Objectives			
Quizzes			
Reading Process			
Materials Analysis			
Readability Formuli			
Sustained Silent Reading			
Functional Reading			
Cloze Procedure			
Understanding the Learner			
Diagnosis			
Use of Questioning			
Usage of English Language (Written and Oral			
Human Relation Skills			
Contracting			
Other			

PEACE CORPS TRAINING

WEEK I (Daily Schedule)

Monday, January 11, 1982

9:00 - 10:00 Registration Introductions

Coffee Break

10:15-12:00 Pretest

12:00 - 1:00 Lunch/

1:00 - 3:00 Reading is a Thinking Process
The Multifacited Reading Process
Understanding the Learner
Diagnosis

Tuesday, January 12, 1982

9:00 - 10:00 Review - Practice diagnosis
Notebook Due with dividers (Final Product) 80%
10:00 - 12:00 Meeting with Participants - Contracting
Materials Analysis
Readability
12:00 - 1:00 Lunch

1:00 - 3:00 continued

Wednesday, January 14, 1982

9:00 - 10:00 Reading Planning and Strategies
Incorporating reading skills into content material

Coffee Break

10:15 - 12:00 noon

12:00 - 1:00 Lunch

1:00 - 3:00 Strategies (See Evaluation Sheeet) Individualized Instruction
will be provided to ascertain that ecah participant acquires skills
in his contract.

Thursday, January 15, 1982

continuation

WEEK II

January 18 - 22

Practicum will be held in a local junior high school. It is anticipated that each participant will be assigned a minimum of one student to assess and prescribe for. This will take place in a mini school under Dr. Smith's supervision. We will also solicit the assistant of other reading specialists in the building. Trainees will be expected to demonstrate theory learned during week one.
Provisions will be made for observation.

Teacher trainers will in addition give a workshop for each of our participants. All materials will be provided for the workshops.

Teacher trainers will also have the opportunity to work in the reading labs.

Practicum should take place in the morning and planning will take place each p.m.

DAILY LESSON PLAN

Name ______________________ **Week of** ____________________ **Teacher** ____________________

Date ____________________

Instructional Objectives	*Materials	Instructional Strategies	Pupil Activities	Evaluation after the lesson is taught

*D[illegible] Readi[illegible] Sea[illegible]k, [illegible]per[illegible]e S[illegible]es, [illegible] Fun [illegible]ling

UNIVERSITY OF THE DISTRICT OF COLUMBIA

GUIDE TO PLANNING FOR ONE ACTIVITY

Date____________________

Grade____________________

Title (specific, to identify the activity) Approximate Time__________

I. Instructional objective
What is to be taught. You should be able to measure the accomplishment of the instructional purpose, at the conclusion of the lesson.

II. Materials (if they need to be planned for ahead of time)

III. Procedures (sequential steps of action)

A.	Initiation or Motivation or Stimulation	Should draw from previous experiences of children in or outside of school
B.	Steps in Sequence	Should include mechanics and organization, directions, major ideas, facts and concepts to be developed.

1. Ask children ......etc.
2. Show pictures ......etc.

IV. Summary (from Children)
Should include what was done or accomplished in terms of the instructional objective.

V. Evaluation (from children)
Should include how well activity was done and suggestions for improvement.

VI. Follow-Up or Projection (may or may not be a definite assignment, depending on the nature of the activity)

VII. References

BEST COPY AVAILABLE

ACTION VERBS

COGNITIVE

Knowledge

checks
defines
describes
identifies
labels
lists
matches
names
outlines
reproduces
selects
states

Comprehension

converts
defends
determines
distinguishes
equates
estimates
explains
extends
generalizes
gives examples
infers
paraphrases
predicts
rewrites
summarizes
translates

Application

finds a way
foresees
interpolates
interprets
manipulates
modifies
operates
predicts
prepares
produces
programs
relates
schedules
shows
solves
uses

Analysis

breaks down
classifies
diagrams
differentiates
discriminates
distinguishes
divides
identifies
illustrates
infers
outlines
points out
relates
selects
separates
subdivides

generates
groups
indexes
invents
modifies
organizes
plans
prescribes
projects
ranks
rearranges
reconstructs
relates
reorganizes
revises
rewrites
summarizes
tells
writes

Evaluation

appraises
compares
concludes
contrasts
corrects
criticizes
describes
diagnosis
discriminates
explains
justifies
interprets

AFFECTIVE

Receiving

asks
chooses
describes
follows
gives
holds
identifies
locates
names
points to
selects
sits erect
specifies
replies
uses

Responding

answers
assists
compiles
conforms
discusses
greets
helps
labels
performs
practices
presents
reads
recites
reports

justifies
proposes
reads
reports
selects
screens
shares
studies
surveys
works

Organization

adheres
alters
arranges
combines
compares
completes
defends
explains
generalizes
identifies
integrates
modifies
orders
organizes
prepares
relates
synthesizes

Characterization

acts

Exh. - 4

Assignment For Field Placement

(Arranged By: UDC Office of Field Placement)

Period: Monday, January 18, 1982 through Friday, January 22, 1982

All field placements are in the D.C. Public Schools in traditional classroom settings:

Area	Placement
Basic Adult Education	Adult Education Demonstration Center Franklin Center 13th and K Streets, N.W.
Math and Science Education	Ballou High School and Mann Elementary School Program Demonstration Science Program
Reading and Language Arts	Rabaut Jr. High School
Art Education (Industrial)	Penn Vocational Center
Drafting	Woodson High School
Electrical/Auto Mechanics	Phelps Vocational High School
Home Economics and Health Education	Burdick High School
Agriculture Education	U.S.D.A. Experimental Station and Phelps Vocational High School
Radio Communications Education/Evaluation	WYCB - AM Radio National Press Building

University of the
District of Columbia

COLLEGE OF EDUCATION AND HUMAN ECOLOGY
1100 HARVARD STREET, N.W.,
WASHINGTON, D.C. 20009

OFFICE FOR COORDINATION OF FIELD
SERVICES AND STUDENT TEACHING

Dear Co-Worker,

The University of the District of Columbia is very grateful that you have indicated your willingness to guide one of the Peace Corps Volunteers during this semester.

This letter introduces ________________________________ who

has been assigned to work with you from ____________________ to ____________________.
Date Date

The College Supervisor will have a meeting with cooperating teachers and will look forward to seeing you at that time.

We are giving you some copies of materials, and we hope that these materials and conferences with the students will be helpful in interpreting the program and it's goals.

We hope that each student will be able to participate in a small way from the first day in your classroom. Gradually he/she should be able to increase his/her responsibilities.

We appreciate this opportunity to be associated with you in such a vitally important professional endeavor. We shall try to do everything possible to insure maximum results from the time and effort put into this program. We know that you will do the same. If any problems arise please do not hesitate to get in touch with your student's supervisor or with me. The office phone numbers are 673-7049 or 673-7050.

Thank you again, and best wishes.

Sincerely yours,

Miriam C. Everette

Miriam C. Everette
Director of Student Teaching

UNIVERSITY OF THE DISTRICT OF COLUMBIA
GEORGIA AVENUE HARVARD STREET CAMPUS
1100 HARVARD STREET, N. W.
WASHINGTON, D. C. 20009

OFFICE FOR COORDINATION OF FIELD
SERVICES AND STUDENT TEACHING

The Seven Components of An Instructional Activity

1. Initiating The Class
2. Stating The Behavioral Objective
3. Recalling The Immediate Prerequisites
4. Reviewing Home Study Assignments
5. Introducing New Information
6. Providing Practice and Feedback
7. Closing The Class

FINAL

UNIVERSITY OF THE DISTRICT OF COLUMBIA
1100 HARVARD STREET, N. W.
WASHINGTON, D. C. 20009

STUDENT TEACHER EVALUATION: SECONDARY PROGRAM

Name of Student________________________________ Date________________________________

Subject or Grade Taught________________________ School______________________________

Cooperating Teacher use ✓ College Supervisor use X	A Outstanding		C Average		F Failure
	A	B	C	D	F
1. Competence in subject matter....................					
2. Knowledge of pupils....................					
3. Providing for health, welfare, and needs of pupils....................					
4. Control and influence over pupils....................					
5. Competence in motivating learning....................					
6. Planning and preparation....................					
7. Skillful use of techniques and materials....................					
8. Evaluation of pupil progress....................					
9. Initiative, resourcefulness, and industry....................					
10. Quality of speech....................					
11. Meeting responsibilities as a teacher, (out-of-class duties, records and reports, school procedures, school property)....................					
12. Professional relationships with teachers, administrative officers, parents....................					
13. Courtesy, tact, self control, poise....................					
14. Participation in school and community activities (meetings, extra curricular, PTA....................					
15. Potential for growth as a teacher....................					

TO BE COMPLETED BY THE COOPERATING TEACHER:

Recommended Final Grade______

Number of Absences________
Number of Times Tardy______
Comments:

____
Cooperating Teacher's Signature

TO BE COMPLETED BY THE COLLEGE SUPERVISOR:

Recommended Final Grade______

Course Designation
Comments:

____
Signature of College Supervisor

TO BE COMPLETED BY THE STUDENT TEACHING DIRECTOR

Total Hours: Observation __________
Teaching__________

____
Student Teaching Director

MIDTERM
MIDTERM

UNIVERSITY OF THE DISTRICT OF COLUMBIA
1100 Harvard Street. N.W.
Washington D. C. 2008

STUDENT TEACHER EVALUATION: SECONDARY

Name of Student ______________________ Date ______________________

Subject or Grade Taught ______________________ School ______________________

Cooperating Teacher use ✓ College Supervisor use X	A Outstanding		C Average		F Failure
	A	B	C	D	F
1. Competence in subject matter..........					
2. Knowledge of pupils..................					
3. Providing for health, welfare, and needs of pupils..............................					
4. Control and influence over pupils..........					
5. Competence in motivating learning..........					
6. Planning and preparation..................					
7. Skillful use of techniques and materials....					
8. Evaluation of pupil progress..............					
9. Initiative, resourcefulness, and industry...					
10. Quality of speech........................					
11. Meeting responsibilities as a teacher, (out-of-class duties, records and reports, school procedures, school property).........					
12. Professional relationships with teachers, administrative officers, parents............					
13. Courtesy, tact, self control, poise.........					
14. Participation in school and community activities (meetings, extra curricular, PTA....					
15. Potential for growth as a teacher..........					

TO BE COMPLETED BY THE COOPERATING TEACHER:

Recommended Final Grade ______

Number of Absences ________
Number of Times Tardy ______
Comments:

____
Cooperating Teacher's Signature

TO BE COMPLETED BY THE COLLEGE SUPERVISOR:

Recommended Final Grade ______

Course Designation
Comments:

____
Signature of College Supervisor

TO BE COMPLETED BY THE STUDENT TEACHING DIRECTOR
Total Hours: Observation ________
Teaching

____
Student Teaching Director

EXIT COMPETENCIES FOR STUDENT TEACHERS - D. C. Public Schools

Student teacher______________________________ School____________________

Subject______________________________ Grade Level____________________

Observed by:________ ____

DIRECTIONS: The student teacher will be appraised from 1 to 5 under each area under management performance and instructional performance. A rating of 1 means Outstanding; 2 means Very Good; 3 means Satisfactory; 4 means Conditional; and 5 means Unsatisfactory.

	Date: ______ Time: ______ Initial Appraisal	Date:______ Time:______ Mid-Point Appraisal	Date: ______ Time: ______ Final Appraisal
A. Management Performance			
1. The appraisee will demonstrate the ability to communicate with students.....			
• Praises and encourages students' actions • Accepts and uses students; ideas clarifies, builds, and develops • Communicates with students in terms they can understand • Develops students' understanding of the needs of various roles, rules, goals • Provides experiences which promote the development of critical and independent thinking			
2. The appraisee will demonstrate a knowledge of and rapport with students and control of classroom			
• Provides recognition for individual student successes • Acts objectively in dealing with students' aggressive behavior • Creates an atmosphere of cooperativeness with mutual respect for feelings, rights, abilities of others.			

	Date: ________ Time: ________ Initial Appraisal	Date: ________ Time: ________ Mid-Point Appraisal	Date: ________ Time: ________ Final Appraisal
3. The appraisee will demonstrate planning and preparation....... o Reveals in his/her objectives organized planning to include basic elements, such as: behavioral objectives, instructional activities, summary, evaluation, and assignment or follow-up • Has materials organized and easily accessible • Moves smoothly from one activity to another o Employs flexibility • Shows and maintains evidence of methods for evaluating students and meeting their needs • Organizes objectives to provide for continued growth of students			

COMMENTS/RECOMMENTATIONS:

	Date:________ Time:________ Initial Appraisal	Date:________ Time:________ Mid-Point Appraisal	Date:________ Time:________ Final Appraisal
3. The appraisee will display a physical environment which facilitates positive learning... o Arranges furniture and materials in position for effective attainment of lesson objectives o Displays and uses bulletin boards, charts, pictures, and other visuals to enhance instruction o Controls and changes physical aspects (heat, light, ventilation, etc.)			
B. Instructional Performance			
1. The appraisee will demonstrate knowledge of subject matter... o Reveals in instructional settings through objectives that the appraisee knows the content of his/her field o Identifies and relates subject matter to school curriculum/instructional program o Relates the subject matter to students' experiences			
2. The appraisee will apply knowledge of materials and techniques in subject field... o Adjusts materials to students' learning ability o Provides a variety of enriching learning materials o Utilizes students' help in establishing objectives, clarifying personal group goals and defining problems for study o Adapts new ideas and techniques			

TABLE ONE

CHARACTERISTICS AND PROPERTIES OF COMPONENT ONE OF A CBC INSTRUCTIONAL ACTIVITY

COMPONENT	PROPERTIES	CHARATERISTICS
1. Initiating the class	1. A. Regular Pattern	1.A. Pose a problem or puzzle
	B. Variation Which Pattern	B. Explain how an activity relates to gaining a new competency
	C. Draws Learner Focus to Teacher	C. Have students recite or perform some action in unison
		D. Present an interesting or unusual fact
		E. Offer an analogy using previously leanred material
		F. Ask for recognition of familiar materials

TABLE TWO

Summaries the characteristics and properties associated with component two of a CBC instructional activity.

Characteristics and Properties of Component two of a CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
. Stating the Informal Behavioral Objective	2. A. Present the objective in Words appropriate to the student Audience	2. A. Write a Statement - the Informal Behavioral Objective at the beginning of the class
	B. Present the objective in Writing (e.g. chalkboard, overhead, slide, or bulletin board)	
	C. State the objective in words	
	D. Have Two or Three students in Class Restate the Objective in their own Words	

TABLE THREE

Summaries the characteristics and properties associated with component three at a CBC instructional activity.

Characteristics and Properties of Component Three of a CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
3. Recalling the Immediate Prerequisites	3. A. Recall Needed Prerequisites for Mediation	A. Review previous classes
	B. Select Prerequisites Competencies from Learning Sequence	B. Show parts of media used to present information originally
		C. Summarize the competencies needed
		D. Recall with assessment tasks already used for testing
		E. Review from printed materials

TABLE FOUR

Characteristics and Properties of Component Four of a CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
4. Reviewing the study Assignment	4. A. Review Home Study Work Immediately	4. A. Student correct errors
	B. Use Home Study as Teaching Not Testing	B. Exchange papers
	C. Provide Positive Feedback for students Effort	C. Students explain tasks

TABLE FIVE

Characteristics and Properties of Component Five of A CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
5. Introducing New Information	5. A. Organize the information by presenting the concept of principle and then illustrations of it; or present examples and require students to create the concept or principle	5. A. Lecture B. Socratic Narrative C. Media Presentation D. Written Passage E. Stimulation
	B. Define all new terms	F. Laboratory
	C. Offer clear concise examples	G. Practical H. Teacher Demonstration
	D. Provide for an active learner role whenever possible	I. Teacher Explanation
	E. Provide appropriate visual or oral clues or other memory aids	

TABLE SIX

Summarizes the characteristics and properties associated with component six of a CBC instructional activity.

Characteristics and Properties of Component Six of a CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
6. Providing Practice	6. A. Space practice over several trials	6. A. Teacher or written materials directs activity
	B. High ability students will probably need less practice that other students	B. Include only pertinent information
	C. Design practice to move from easy to difficult items	C. Provide detailed guidance
	D. Provide real problems whenever possible	D. Provide positive feedback for all efforts
	E. Very the problem settings	E. Organize for memorization of patterns with mnemonics
	F. Offer individual positive feedback	F. Offer wide range of problem types
	G. Self Assessment	G. Provide real settings and actual conditions whenever possible

TABLE SEVEN

Summarizes the characteristics and properties associated with component seven of a CBC instructional activity.

Characteristics and Properties of Component seven of a CBC Instructional Activity

COMPONENT	PROPERTIES	CHARACTERISTICS
7. Closing	7. A. Summary	7. A. Summarize the activity
	B. Clarify Home study Assignment	B. Assign Home Study
	C. Assessment	C. Students Restate Home Study Assignment

7. D. Administer
Assessment Tasks

There are several general characteristics which apply to all instructional activities: (1) attempt to involve the student as an active learner whenever possible, (2) engage the learner in at least two (2) different responding modes for each instructional activity, (3) a minimum of two (2) different instructional activities are required to maximize the number of students acquiring a given behavior or competency, (4) the pattern of student responding modes should be difficult for the two (2) required instructional activities. Table Eight summarizes the various organizational formats of instructional activities and the student responding modes usually present.

UNIVERSITY OF THE DISTRICT OF COLUMBIA
GEORGIA AVENUE HARVARD STREET CAMPUS
1100 HARVARD STREET, N. W.
WASHINGTON, D. C. 20009

OFFICE FOR COORDINATION OF FIELD
SERVICES AND STUDENT TEACHING

TABLE EIGHT

Organizational Format for Instructional Activities and Student Responding Modes.

FORMAT	DESCRIPTION	STUDENT RESPONDING MODE
Lecture	1. Talk by a single speaker to a group.	1. Writing notes and listening
Lecture with Questions	2. A talk by a single speaker to a group. Questions by lecturer and by students.	2. Writing notes, listening, questinging, and responding
Student Demonstration	3. Student actually goes through porcedures as they are really conducted.	3. Writing notes and listening
Practiced Exercise or Laboratory	4. Students practice under conditions of minimum guidance in a real setting	4. Perform task, write steps, findings, and conclusions, and directions
Seminar	5. Group discussion of topic with extensive prior preparation	5. Listening, questions, reading or viewing for preparation
Case Study or Incident Study	6. Group analysis of preselected case history under the direction of an experienced discussion leader	6. Reading or viewing for preparation, writing notes, questioning, listening
Site Visits	7. Students go to actual site of operation, direct observation of place and procedures	7. Observing, listening, asking
Simulation	8. Real incident or event is acted out, real conditions are reconstructed to approximate actual setting.	8. Observing, analyzing, questioning, protected experience with no penalty for mistakes

Writen Passages	9. Textbooks, Journals, Manuals, and other printed materials examined	9. Reading, Note taking
Media	10. Information presented on film, slide/tape, filmstrips, video cassettes, or other media	10. Viewing, note taking, listening
Small Group	11. Limited number of students trying to resolve a given problem with little or no teacher assistance.	11. Discussion, writing, observing
Conference	12. Discussion by group members group comes to some conclusion about original problem	12. Reading, questioning, listening

OVERVIEW OF WEEK 4

Week 4:

(a) Review of teaching competencies acquired.

(b) Cross-cultural training.

(c) Secondary projects design and implementation training -- Adult literacy.

(d) Final evaluation of volunteers.

(e) Volunteers evaluation of the PSI training program.

(f) Exit counseling

Outcomes for Week 4:

Each volunteer will design a possible secondary project for Liberia.

Each volunteer will evaluate the training program.

WEEK 4 AGENDA -- PSI PEACE CORPS TRAINING

GROUP C

Health Educators

	Monday January 25	Tuesday January 26	Wednesday January 27	Thursday January 28	Friday January 29
A.M.	8:30 - Bus to Optometrist for Eyeglass neutralization After glasses, meet with Dr. Moore at UDC, same room	8:00 - Meeting with Peace Corps Director (Room E-2) 8:30 - 10:00 - Lecture by Dr. Wolf on Third World Health (Room E-4) 10- 12:00 - Complete Learning Packages and Secondary Projects (Room E-2)	9 - 12:00 - Simulated teaching experiences (Room E-4)	9 - 11:00 - Teaching Reading in the Content Areas (All Group C) (Room E-4) 11 - 12:00 - Specific Teaching Methodologies (All Group C) (Room E-4)	OPEN
12-1	L	U	N	C	H
P.M.	Meeting with Dr. Moore - cont'd 4:30-5:00 - Meet in Room E-2.	1 - 3:30 - Individuals collect learning materials/books, etc. (In the field) 4:00 - Meeting with Peace Corps Nurse, Barbara Pyle (Room E-2)	Time to be announced - Liberian Embassy,	12:30 - Bus to Shaw for Final Immunizations	OPEN
5:30	D I	N N	E	R	
	6:30 - 8:30 Cross Cultural All Group: C (Room E-2)	6:30 - 8:30 Cross Cultural (Group C)- cont'd (Room E-2)	6:30 - 8:30 Cross Cultural (Groups A & B) (Room E-2)	6:30 - 8:00 Cross Cultural (Groups A & B)-cont'd--(Room E-4) 8:00 Presentation of Certificates of Completion (Room E-4)	

WEEK 4 AGENDA -- PSI PEACE CORPS TRAINING

GROUP C

MATH/SCIENCE EDUCATORS

	Monday January 25	Tuesday January 26	Wednesday January 27	Thursday January 28	Friday January 29
A.M.	8:30 - Bus to Optometrist for Eyeglass neutralization For those who do not wear glasses, report to Room E-2.	8:00 - Meeting with Peace Corps Director (Room E-2) 9 - 12 - Meet with UDC instructors at UDC/VanNess, Bldg. 42, Room 204.	9 - 12 - Individuals collect learning materials (In the field)	9 - 11 - Teaching reading in the Content Area (All Group C) (Room E-4) 11 - 12 - Specific teaching methodologies (All Group C) (Room E-4)	OPEN
12-1	L	U	N	C	H
P.M.	1 - 5 - Complete learning packages and review secondary projects (Room E-2)	12 -3 - Simulated teaching experiences at UDC/Van Ness. 4:00 - Meeting with Peace Corps Nurse, Barbara Pyle (Room E-2)	Time to be announced - Liberian Embassy,	12:30 - Bus to Shaw for Final Immunizations	OPEN
5:30	D I	N N	E	R	
	6:30 - 8:30 Cross Cultural All (Groups C (Room E-2)	6:30 - 8:30 Cross Cultural (Group C) - cont'd (Room E-2)	6:30 - 8:30 Cross Cultural (Groups A & B) (Room E-2)	6:30-8:00 Cross Cultural (Groups A & B)-cont'd 8:00 Presentation of Certificates of Completion (Room E-4)	(Room E-4)

WEEK 4 AGENDA -- PSI PEACE CORPS TRAINING

GROUP C

ENGLISH/LANGUAGE ARTS EDUCATORS

	Monday January 25	Tuesday January 26	Wednesday January 27	Thursday January 28	Friday January 29
A.M.	8:30 - Bus to Optometrist for Eyeglass neutralization All those who do not wear glasses, report to Room E-2.	8:00 - Meeting with Peace Corps Director (Room E-2_ 9 - 10:30 - Session on Adult Literacy with Groups A and B (Room E-2) 10:30 - 12 - Simulated Teaching Experiences (Room E-2)	9 - 12 - Simulated Teaching Experiences (Room E-2)	9 - 11 - Teaching reading in the content areas-- All Group C (Room E-4) 11 - 12 - Specific teaching methodologies -- All Group C (Room E-4)	OPEN
12-1	L	U	N	C	H
P.M.	1 - 5 - Complete learning packages and review secondary projects (Room E-2)	1 - 4 - Individuals collect learning materials/books, etc. (In the Field) 4:00 - Meeting with Peace Corps Nurse, Barbara Pyle (Room E-2)	Time to be announced - Liberian Embassy,	12:30 - Board Bus to Shaw for Final Immunizations	OPEN
5:30	D I	N N	E	R	
	6:30 - 8:30 Cross Cultural All Group C (Room E-2)	6:30 - 8:30 Cross Cultural (Group C)- cont'd (Room E-2)	6:30 - 8:30 Cross Cultural (Groups A & B) (Room E-2)	6:30-8:00 Cross Cultural (Groups A & B)--cont'd--(Room E-4) 8:00 - Presentation of Certificates of Completion (Room E-4)	

GREETINGS

THE REVISED NATIONAL CURRICULUM
FOR ELEMENTARY SCHOOLS

I great you in the name of the Ministry of Education, Republic of Liberia.

It is indeed a source of pleasure for me to present to you the revised National Curriculum for elementary schools.

For many years Liberia educators have stressed the urgent need for a more relevant curriculum; a curriculum that reflects the cultural heritage and aspirations of the people of Liberia. The revised curriculum is designed to provide functional education for Liberian youths in addition to existing programmes in Liberal education.

Indeed, the revised National Curriculum seeks to fulfil the manpower requirements of our Country. You have in your hands a curriculum which offers a wide variety of educational and vocational experience in the Social Sciences, Natural Sciences, Mathematics, Agriculture, Home Economics, Arts and Crafts, and Music.

While the Ministry of Education has developed this curriculum in consonance with the nation's educational philosophy and collective goals, it is the responsibility of every classroom teacher to interpret the curriculum and impart to their students the experiences developed in this curriculum according to the requirements of any given learning situation.

It is our ardent hope that the revised national curriculum will serve as a basis for educational planning, imporved classroom instruction, and as a gude for teachers in the Liberian educational enterprise.

Yours sincerely,

J. Bernard Blamo
MINISTER

Monrovia
April 1979

FOREWORD

THE REVISED NATIONAL CURRICULUM
FOR ELEMENTARY SCHOOLS

The Ministry of Education is extremely proud of the remarkable strides being made in the process of revising the Elementary School Curriculum for the Nation. This major task commenced nearly ten years ago. Throughout this period it has been revealed that Curri-Development is a continuous process which should involve a cross section of the society. This approach proved necessary to ensure that the prescribed general and specific objectives for learning would reflect the actual needs and goals of the society.

As a result of several years of hard work and numerous efforts we are pleased to note the accomplishments and plans for this program up-to-date:

1. The Elementary Curriculum, which has been revised and improved to include applied skills and work oriented courses in addtion to the fundamental and basic, has gone through three phases of trials, evaluation and revision. The entire effort has been directed to make the curriculum mare relevant, functional and designed to foster more effective learning.

2. The 1979 plans are to put a copy of the revised curriculum in the hands of each elementary teacher. Efforts will be made to have the Nation's Curriculum Center and its network of county materials centers work with teachers in interpreting the objectives and innovations introduced. They will also assist teachers to orientate their instruction to the new approaches required.

The Ministry of Education extends grateful thanks to all who have contributed towards the achievement made thus far with the revision of the Elementary Curriculum. It is our ardent hope that supervisors, principals, teachers and students will play their roles well in utilizing the material to their fullest, noting the curriculum is not to be filed, but used conscientiously to guide instruction. We anticipate their fullest cooperation in presenting the required feed-back and suggestions necessary for subsequent improvement.

Finally, sincere congratulations go to the staff of the National Curriculum Center who have accepted the challenge to speedily and effectively execute the Ministry of Education's plans regarding curriculum and instructional materials development.

Christine T. Norman

Christine T. Norman
DEPUTY MINISTER FOR INSTRUCTION

78

CTN:dng.

INTRODUCTION
THE REVISED NATIONAL CURRICULUM
FOR ELEMENTARY SCHOOLS

The Curriculum Revision Project of the Ministry of Education has been underway for quite some time. After years of sustained and concentrated work, we are now ready to present the first revised version of the elementary curriculum in a systematic form to be distributed to schools and teachers throughout the country. This would be gratifying to all those who have been associated with our society, contributed to our efforts. Many institutions, organizations and personnel have helped us in this endeavor as a team task.

Curriculum occupies a central place in national goals and priorities. With the complexity of changing times, new demands are being made upon education as an instrument of discipline, development and democratization. This places fundamental responsibilities on the educational system which can be performed by it through deliberate, suitable changes in objectives, curriculum, instruction, evaluation and personnel trained for the purpose.

The revised curriculum is based on national goals and priorities and is meant to translate the needs and objectives into its organizational pattern. Different content subject-areas are intended to serve as an instrument for attaining the desired objectives. Each content subject-area and curriculum component within it has thus to contribute singly and collectively for the attainment of the set objectives; together they must provide for the totality of a systematic school program for each grade-level.

As educators we must rise to the occasion: teachers, principals, supervisors, administrators, public authority personnel and community leaders must all pull their weight together to help the schools work with the revised curriculum to provide more meaningful educational programs in the nation's schools throughout the country.

.../2

In order to make copies of the Revised National Curriculum available to all schools and accessible to teachers, the following scheme of compilation has been used.

1. Grade-wise: for grades 1 - 3; one complete booklet for each grade containing all the subject areas.
2. Subject-wise: for grade 4 - 6; one complete booklet for each subject area containing the curriculum for grades 4 - 6.

The present distribution of the Revised National Curriculum is the first major step. It will continue to be improved upon as a result of actual class-room use. At the same time, we plan to follow it up with curriculum guides, istructional materials, books and evaluation devices as relevant to the curriculum and its different subject areas.

The National Curriculum Development Center places on record its appreciation and thankfulness to all those who have contributed to our curriculum revision task. We look forward to their continued association and cooperation.

A special vote of thanks is due Mrs. Christine T. Norman, an enlightened educator in her own right: We are deeply grateful to her for her actual participation in the evaluation of the revised curriculum; also for all her help and encouragement to steer us through many difficult times of stress and strain. Without her bold steps and enthusiastic support this task may not at all have been completed.

Josephine Badio
Josephine Greaves Badio
NATIONAL CURRICULUM COORDINATOR
CURRICULUM DEVELOPMENT CENTER

Monrovia
April 1979

THE CURRICULUM TEAM

Josephine Greaves-Badio - National Curriculum Coordinator
Victoria M. Wilson - Elementary Curriculum Coordinator
Lovette F. Azango - Subject Specialist
Jack G. Okech (Dr.) - Curriculum Specialist
Richard W. Clarke - Subject Specialist
Kirpal T. Singh (Dr.) - UNESCO Expert

ACKNOWLEDGEMENTS:

THE LANGUAGE ARTS REVISION COMMITTEES

A. Doris Banks-Henries, Director, Higher Education
Rita Ray, Education Materials Advisor, USAID/LIB.
James K. Bocker, Comnell Team, University of Liberia
Russell Cassell, Testing Specialist, D.E.
Tertia D. Kaul, Edu. Materials Center, D.E.
Josephine G. Badio, Edu. Materials Ceter, D.E.
Dorothy Cooper, " " " " "
Lydia Zoe Caine, " " " " "

AND

A. Doris Banks-Henries, Director, Higher Education
Lydia Zoe Caine, Edu. Materials Center, M.E.
Beatrice Williams, Asst. Superintendent, MCSS
Thomas Johnson, KRTTI
Richard W. Clarke, Textbook Research, M.E.

All Schools, Teacher Training Institutes, Educators
Principals, Teachers - too many to name, who have,
in one way or the other, contributed to this work.

PART ONE:

CURRICULUM BASES

PHILOSOPHY OF LIBERIAN EDUCATION

Conscious of the unprecedented stride taken by education in Liberia during the decade of the sixties, which resulted in a tremendous growth in enrollment and therefore the establishment of make-shift accommodations, and the compulsion to use unqualified teachers because of the shortage of qualified ones; also aware of the devastating repercussions such a situation had on the maintenance of quality and standard throughout the school system, the Ministry of Education was determined to make the Second Development Decade a period for revolutionizing and reconstructing the educational system. Consequently, in November 1970, a three day curriculum conference was convened to analyze the current situation and to work out a strategy for correcting the prevailing weaknesses and problems. The conference brought together officials and representatives from several public and private agencies.

One of the initial actions of the conference was the adoption of a "Philosophy of Liberian Education". It was based on policy statements made by national leaders, notably the message of President W.V.S. Tubman to the nation on July 3, 1965, on the occasion of National Education Week. The philosophy adopted is as follows:

> "Deep within the democratic heritage of the Liberian nation is embedded our commitment to education and the necessity of making our school the chief and most effective instrument ofour political and social institution, in order that the democratic ideal may not only be meaningful in the present, but that it will become the spearhead of economic, social, political, moral and spiritual reform in the lives of succeeding generations;
>
> "Our total educational program must be such that it will motivate in the learner a respect for the dignity of every human being; develop and appreciation for the dignity of labour; instill in them a desire for learning; and a desire to attain self-reliance and the fulfillment of self-realization. Furthermore, the program must be based on the irrevocable belief that universal education is not only desirable but essential to the success of a democratic society;

GOALS AND PRIORITIES FOR LIBERIAN EDUCATION

The long term goals of the Education Program are:

1. To develop the total individual so that he will become a loyal citizen and make useful and continuous contribution toward his own development and that of the nation;

2. to provide universal, basic education through the formal and non-formal process, so as to help the masses improve their living standard and tackle the immediate problems of literacy, sanitation, food production and preservation.

3. to strengthen scientific and technological learning as a basis for the speedy industrialization and economic advancement of the nation;

4. to stimulate, conserve and promote the cultural heritage as well as the national policies of unification and integration; and
5. to ensure equitable geographic distribution of educational opportunities.

These goals are to be achieved during the plan period through programs and projects centered around the following priorities:

1. Qualitative improvement of the instructional program through the
   (a) production and retention of qualified teachers and educational specialists;

   (b) development of a functional, diversified and relevant curriculum.

(c) provision of adequate physical facilities; and
(d) development of an efficient supervisory system;

2. Production of an efficient and adequate manpower to meet the nation's needs, with emphasis on vocational and technical education;
3. Strengthening the organizational and managerial infrastructure of the educational system, including regional decentralization of control; and
4. Expansion of basic, non-formal educational opportunities.

THE REVISED CURRICULUM OBJECTIVES FOR ELEMENTARY SCHOOL

The aims and objectives of the elementary school program are translated into action terms in the revised curriculum which makes provision for pupils to acquire the skills necessary for:

(a) Communicating effectively;
(b) Calculating and numerating with ease;
(c) Understanding the physical environment developing social and the technologically oriented world;
(d) Understanding the social environment, developing social and ethical values, and equipping for effective civic participation;
(e) Preparing for productive use of leisure and aesthetic self-expression;
(f) Acquiring manual dexterity and appreciation for the dignity of labour as a preparation for subsequent training and employment; and
(g) Laying foundations for continuing education.

REVISED CURRICULUM FOR LANGUAGE ARTS-ENGLISH IN THE ELEMENTARY SCHOOL: INTRODUCTION

Language Arts in the Elementary Curriculum is primarily intended to provide meaningful experiences and develop worthwhile habits which will enable the pupil to comprehend appropriately and communicate effectively in English in order to function in life and use the language as a tool for further learning.

In the earlier grades much stress is geared towards developing the ability of the pupil to understand and speak the language. The pupil learns to listen to simple sounds of nature and interpret them. Listening at this state is very successful when it comes to recalling directions, poems, stories. The pupil learns how to listen to phonetics and repeat the sounds.

In the latter grades, the focus turns to written communication. The pupil then proceeds to write as well as speak the language with a reasonable degree of skill. Also the pupil learns to develop an appreciation of good literature-Liberian, African and the International Community around. The language is gradually integrated into the other subject areas and used as a tool for further learnings. Consequently, the pupil becomes a skillful communicator in our official language.

The curriculum suggests some interactions that should be useful for each level of content activities. The Language Arts program also integrates other subject areas into its scope.

PART TWO:

GRADE LEVEL CURRICULUM

LANGUAGE ARTS CURRICULUM

GRADE FOUR

PAGE

TABLE OF CONTENTS........................8

OBJECTIVES OF THE ELEMENTARY LANGUAGE ARTS-ENGLISH CURRICULUM.. 9

General Objectives
Specific Objectives

SCOPE AND SEQUENCE 10

CONTENT AND ACTIVITIES 11-17

EVALUATION.. 18

READING REFERENCE AND RESOURCE MATERIALS 19

OBJECTIVES OF THE ELEMENTARY LANGUAGE ARTS - ENGLISH CURRICULUM

GENERAL OBJECTIVES

The general objectives of the Elementary Language Arts - English Curriculum are to provide for the development of those skills, interests, habits and values which will enable the pupils to:

1. Communicate in English both orally and in written composition effectively for example, speak clearly and write legibly.
2. Listen attentively and with understanding (comprehension).
3. Read with ease, speed and comprehension through constant drills and exercises.
4. Appreciate good literature and styles of famous authors through constant exposure to different types of literary forms.
5. Understand the social, cultural, linguistic, and ethical environment and observe the role of language as a conveyor of the cultural hertitage.
6. Develop socially desirable and courteous speech.
7. Integrate the concepts of the English language into other content areas.
8. Lay foundations of creative writing necessary for continuing education.

SPECIFIC OBJECTIVES

The specific objectives of the Language Arts English Program being stated gradewise in terms of the abilities, skills interests, and habits to be developed are reinforced at each grade level.

Grade IV

1. Ability to:

   a. Write sentences
   b. Capitalize
   c. Use correct margin
   d. Listen and comprehend
   e. Recognize phonetics and structure of words
   f. Copy from resource materials
   g. Speak with articulativeness
   h. Recite poems
   i. Recognize descriptive words in phases
   j. Read continuously
   k. Participate in class interaction

SCOPE AND SEQUENCE CHART

Grade Four

ORAL COMMUNICATION (SPEAKING)

Skills taught in previous grades are reviewed and developed: Emphasis is placed on articulation evidenced by dramatization, speeches making annoucements, reading poetry, and discussions.

LISTENING

The skills used for listening in previous grades are integrated into other content areas. Evaluation is shown through pupil's ability to interpret information or details.

WRITTEN COMMUNICATION

Review Grade III; Emphasis placed on obtaining fluency in cursive handwriting. Also writing letters and other communication.

READING

Analyzing the story: (1) Introduction (2) Discussion
Oral and silent reading, Reason for reading: (a) pleasure (b) information. Identify and evaluate Literary forms, initial exposure to good authors

WORD STUDY

Learn new words from literature phonetic terms to be mastered:
(a) consonants (b) vowels (c) blends (d) double consonats
Different kinds of words: (a) root (b) inflectional (c)derived

Reading Plan

Pupils in fourth grade will do as much silent as oral reading. Lessons may be carried on in a variety of ways:

Pupils may read silently to find answers to questions.

Selected parts of a story may be read orally.

Stories may be dramatized

Pupils may read part of a story and make up their own ending, then compare with the author's ending, etc.

The suggestions in the teacher's manual should be followed in developing a lesson. A story will take more than one day to be effective.

One or more periods will need to be spent on word attack skills, developing vocabulary, and other mechanics of reading.

1. Introduce the story

Talk about the story and explain the incident and word meaning for the pupils. If a story has a setting in another country, for example, talk about that country and how the people live. If the characters have an experience foreign to the pupils, try to give them understanding.

2. Learn new words

New words for the lessons are given in the teacher's manual. These should be introduced before the material is read. Write them on the board, sound them out, use them in phrases and in sentences so that the pupil sees, hears, and uses the words.

Divide the word into syllables when the situation occurs.

3. Read silently

Pupils should have an opportunity to read silently before reading aloud.

4. Discuss the story

Encourage pupils to think and to talk about what they have read in terms of their own experiences.

5. Read orally

Plan to read the entire story or parts orally.

Pupils need to be taught how to read silently. To begin with tell them: "Read to find out why John became startled," or "Read to see what you would have done."

Note: Be certain that each pupil can read at the level expected of him. If a pupil misses more than one word out of twenty running words, if he has to be told every fourth or fifth word, the book is too difficult. He will become frustrated and will not learn when this is the case. A group of children in class may read an easier book, or one pupil may need to be given extra help and practice reading out of an easier book. To succeed in reading, a pupil must believe he can succeed.

The suggestions for introducing reading and learning new words should be followed throughout the school year.

I. READING SKILLS AND CONCEPTS

A. Vocabulary Development

1. At this level the dictionary is an indispensable tool for learning the meaning and pronunciation of unknown words. Much time should be spent to reinforce and stress the use of the dictionary.
    (a) To locate words quickly.
    (b) To translate the pronunciation symbols or keys.
    (c) To choose the meaning intended by the Author and to adopt the meaning to the sentence in which the word is used.
2. Review and reinforce homonyms, synonyms and antonyms.
3. Identify root words in inflected or derived forms.
   (Many lessons are developed to help teach the children how to use a dictionary).

B. Word Analysis

1. Phonetic Analysis - Noting the various sounds and symbols each sound stands for in a word.
2. (a) Teach the children that printed language represents spoken language.
    (b) That spoken words are patterned arrangements of consonant and vowel sounds.
    (c) The consonant and vowel sounds are represented by letters in printed words.

93

(d) That a letter (or combination of letters) may represent more than one sound.

(e) That the same sound may be represented by more than one spelling pattern (eg. book, blow, broke, boat).

(f) That the relationship between consonant letters and consonant sounds is relatively stable.

(g) That every vowel letter represents more than one sound and the vowel clue to vowel sound is the spelling pattern (a = bake, bar, bat, bare).

(h) That words may have one or more than one syllable.

(i) That in words of more than one syllable, one syllable is accented more than the other or others.

(j) Visual clues to vowel sounds usually apply only to accented syllables.

(k) The vowel sound heard more frequently in unaccented syllables is the schwa ( ) which may be represented by any vowel letter.

(l) These are phonetic terms to be stressed and mastered.

- (I) Consonants - B C D F G H J K M N Q S T V W Z Y P
- (II) Vowels AEIOU sometimes "Y" when it is at the end of a word
- (III) Consonant blend - br, pl, sm, st, str.
- (IV) Consonant digraphs th, wh, ph, ch, sh, etc.
- (V) Vowel diphthongs = oi, ai, oy, ay
- (VI) Slight letter - wr = wright; kn - knight, gh = night
- (VII) Double consonant (eg. letter lesson)
- (VIII) Consonant substitution

(m) Usual clues to vowel sounds in one syllable word should be stressed and mastered.

- (I) A single vowel letter followed by one or two consonant letters is usually short. lamp lap cat Cathy
- (II) A single vowel letter followed by one consonant letter and final e usually is long. late pete
- (III) A single vowel letter followed by two consonant letters and final e usually is short. dance fence
- (IV) A single vowel letter followed by r the vowel sound is usually r controlled bar large term serve etc.
- (V) A single vowel letter at the end of a word usually stands for long sound be, no, hi, me

(VI) Two vowel letters coming together in a word usually stand for a long vowel sound. main, sea, sea boat

(VII) Two consonant letters coming together followed by an r the vowel sound is probably r controlled.

(VIII) The letter ay, ae, or, ir together at the end of a word usually stand for a long vowel sound.

(IX) The letter a followed by two l's or by [illegible] and another consonant letter usually stands for the vowel of all.

(X) The letter a followed by w usually stands for the vowel of all.

(XI) The letter i followed by gh usually stands for the long i sound.

(XII) Review and emphasize the function of the Pronunciation key - which is the key listing the symbols used in the pronunciations.

1. To be able to pronounce words written in pronunciation symbols.
2. To be able to spell words in pronunciation symbols.

II. STRUCTURAL ANALYSIS

(a) Teach children that a word may be a

1. Root Word - (play)
2. Inflected form (played)
3. Derived form (playful)

(b) That a root word retains its meanings in an inflected, derived or compound form.

(c) That an affix (an enduring prefix, or suffix) has a meaning and/or function.

(d) That the meaning of an affix combined with that of a root word mark an inflected or derived form.

(e) That the spelling of a word may change before an ending or suffix.

(f) That although the intonation of speech are completely presented in language, punctuation and certain other graphic devices provide clues.

(g) That language grows and changes as new words are coined for new products inventions, experiences. Words are borrowed from other language, old words take on new meanings and uses.

(h) Teach the children to scrutinize the whole word before analysis.

(i) Teach the children to perceive syllables and accent.

C. COMPREHENSION AND INTERPRETATIVE SKILLS

1. Help the children recognize purpose for reading.
    a. For pleasure
    b. To gather information and facts
    c. To inform others
    d. To criticize
2. Teach the children to comprehend literal (word for word) and implied meanings of words, phrases, sentences, and longer passages.
3. Teach children to perceive relationship as they read. (Sequence, cause-effect) part, whole, time, space, time-place-value, analogous, general-specified class size, between details, between main ideas and supporting details, between units of meanings in different word form).
4. Teach children to follow sequences of ideas as they read.
5. To note and recall details of what is read.
6. To grasp main idea and identify supporting details.
7. To identify internal clues of recognizing roles of individual paragraphs in total pattern of writing.
8. To form and react to sensory images.
9. Make and check references.
10. To anticipate action, emotion response, or outcome.
11. To compare and contrast - characters, settings, themes, purpose.
12. Sense emotional reactions, infer motives and identify personal traits of story characters.
13. Evaluate actions and personal traits of story characters.
14. Identify points of view and attitudes of story characters.
15. Organize and summarize ideas.
16. Help children to react to content, link it to personal experiences and assimilate ideas.
17. Evaluate, make judgement, draw conclusions and generalize in light of author's purpose, mood, or attitude.
18. Follow sequence, and recognize a well constructed plot.
19. Recognize and respond to clues to pace, mood, pitch, intonation, stress and rate in oral reading.

20. Locating information for specific purposes - from different types of reference materials.
    a. Use alphabetical arrangement and guide words
    b. Use of dictionary, index, encyclopedia, library card, index and other sources.
    c. Use of table of contents, chapter, titles, section, title topic and headings to locate information.
21. Recognize and identify ways an author protrays or reveals characters.
22. Identify and evaluate element of style used by the author.
    a. Figurative language; picturesque and idiomatic language; colloquialism, slang and delect, personification.
    b. Refrain, repetition and rhythm, onomatopoeia.
    c. Choice of words, sentence structure and punctuation.
    d. Foreshadowing and flashback.
23. Identify and evaluate Literary forms. The children should be exposed to and encouraged to read and appreciate each of these forms. By doing we will encourage not only good readers but also Liberian writers of each of the forms.

A. POETRY - HIAKU, SONNET, BALLADS
    1. Simple poetry and verses
    2. Sonnets and Ballads
    3. Hiaku - Japanese style
    4. Etc.

B. PROSE
    NON-FICTIONS
    1. Newspaper articles and magazines
    2. Letters
    3. Reference Materials (Atlas, Almanac, Encyclopedia, Dictionary, Documentary).
    4. Autobiographies and Biographies
    5. Essays, composition, report.
    6. Sermons, speeches

C. FICTIONS

1. Historical
2. Science
3. Mystery
4. Drama
5. Myths, legends, fairy tales
6. Everyday life fiction
7. Identify and evaluate author's purpose and the techniques used to achieve his purpose.

D. DEVELOPING SKILLS IN ORAL AND SILENT READING:

At this level equal emphasis must be placed on vocabulary development; analysis skills; and the comprehension and interpretative skills which are spelled out fully under subheadings A, B and C.

There should be a special period preferably Spelling Period to develop the word analysis skills. The comprehension skills should be attacked and discussed fully as silent and oral reading lessons are conducted. Both silent reading and oral reading should be for a purpose. The purposes are those spelled out under subheadings C 1 - 33

EVALUATION

Evaluation is an on-going process of an instructional system. In order for an instructional program to be successful and effective, there should be appropriate pupil-evaluation and teacher-evaluation of materials covering the learning objectives in all areas of the Language Arts Program, at a particular age-grade level.

The evaluation process really starts from the initial time a teacher comes in contact with the students (diagnostic evaluation) to the end (summative evaluation). The record of all evaluations should be kept safely and made available when requested.

Teachers know that, evaluation at the elementary level covers a wide range of experiences and exercises which necessitate the use of a variety of oral and written devices. Therefore a list of suggested evaluation is being included in the curriculum in order to help the teacher in evaluating teaching-learning in the Language Arts Program. The teacher can then devise his/her own strategy as the need arises.

GUIDELINES FOR EVALUATION

Grade IV

Pupils will read aloud and interpret what is read. Pupils will also read silently and write interpretation. Teacher can evaluate the outcome of work done separately. Pre-tests are applicable here to test pupils' ability to read, Written evaluation is also necessary for word study.

NOTE: At all levels the teacher must be alert enough to make some subjective evaluation as well.

READING REFERENCE AND RESOURCE MATERIALS

1. Kirby, Anne, Elementary School English (Addison - Wesley Publishing Company, Ontario, 1967)
2. Trauger, P., Language Arts in Elementary Schools, (McGraw-Hill Inc., London, 1963)
3. Anderson, Freeman B. et al. New Directions in English Series 4 (Harper & Row, Publisher, London, 1969)
4. Gogg, J. C. Evans Primary English for Sierra Loone Book 4 (Brothers Limited, London, 1975)
5. Ogundsge, P.A. and Tregidgo, P.S. Practical English &(Longman Groups Limited, London, 1977) Series 4
6. Clay Margaret Pangallo, Roads to Spelling (United Methodist Church, Monrovia, 1975)

LANGUAGE ARTS CURRICULUM

GRADE FIVE

PAGE

TABLE OF CONTENTS 20

OBJECTIVES OF THE ELEMENTARY LANGUAGE ARTS - ENGLISH CURRICULUM 21

General Objectives 21

Specific Objectives 21-22

SCOPE AND SEQUENCE 22

CONTENT AND ACTIVITIES 23-25

EVALUATION 26

READING REFERENCE AND RESOURCE MATERIALS 27

OBJECTIVES OF THE ELEMENTARY LANGUAGE ARTS - ENGLISH CURRICULUM

GENERAL OBJECTIVES

The general objectives of the Elementary Language Arts - English Curriculum are to provide for the development of those skills, interests, habits and values which will enable the pupils to:

1. Communicate effectively in English both orally and in written compositions effectively, for example, speak clearly and write legibly.
2. Listen attentively and with understanding (comprehension),
3. Read with ease, speed and comprehension through constant drills and exercises.
4. Appreciate good literature and styles of famous authors through constant exposure to different types of literary forms.
5. Understand the social, cultural, linguistic and ethical environment and observe the role of language as a conveyer of the cultural heritage.
6. Develop socially desirable and courteous speech.
7. Integrate the concepts of the English language into other content areas.
8. Lay foundations of creative writing necessary for continuing education.

SPECIFIC OBJECTIVES

The specific objectives of the Language Arts English Program are being stated grade-wise in terms of the abilities, skills, interests, and habits to be developed and reinforced at each grade level.

Grade V

Ability to:

a. Write simple paragraphs
b. Construct written communication
c. Use correct margin
d. Listen and comprehend
e. Recognize phonetics and structure of words
f. Copy from resource materials
   eg. dictionary, encyclopedia
g. Speak with articulativeness
h. Make speeches
i. Recognize descriptive words in phrases
j. Read
k. Participate in class interaction

102

Interests and habits needed to:

a. Speak with courtesy
b. Differentiate the types of sentences
c. Develop vocabulary
d. Understand instructions
e. Learning of words
f. Differentiate between singular and plural words
g. Communicate effectively
h. Become exposed to literature and authors
i. Recall information orally
j. Apply reading ability to other content areas.

SCOPE AND SEQUENCE CHART

ORAL COMMUNICATION (SPEAKING)

Work done in Grade IV extended

LISTENING

A further development of Grade IV including participating in discussions, relating events, giving opinions on news, newspapers, magazines and other informative materials.

READING

Distinguishing facts from fantasy and opinions. a. Using dictionary b. Using diacritical marks c. Skimming d. Locating information e. Analyzing author's purpose f. Analyzing the story g. Elements of style h. Developing characteristics of a competent reader i. Development of Grade IV

WRITTEN COMMUNICATION

Extension of Grade IV

WORK STUDY

Development of Grade IV

GRADE FIVE

READING

Reading skills mastered in Grade Five should be extended to the other content areas and not only confined to the reading program. At this level of reading instruction, skills and concepts acquired in vocabulary development, word analysis and dictionary usage are reviewed, reinforced, and expanded. Comprehension now demands more matured thinking as reading materials are more complex and include longer sentences and stories, historical fiction, drama, poetry and biography.

Since reading ability is not mastered at any particular age or grade level, silent, oral and independent reading are continued to be stressed. Children who have reading deficiencies are given individual help according to their weaknesses.

1. READING SKILLS AND CONCEPTS

VOCABULARY AND WORD ANALYSIS

A. Vocabulary and word analysis skills are reviewed and expanded. Dictionary skills are continued to be developed and reinforced on the intermediate level. See skills and concepts for the elementary grades.

B. COMPREHENSION AND ATTITUDES

1. Getting the central idea of a selection
2. Reading to solve problems and answer questions
3. Predicting outcomes on the bases of clues given by the author
4. Adopting an inquiring attitude
5. Learning about the author or authors
6. Matching ideas with paragraphs
7. Skimming to verify statements and specific details
8. Using the dictionary
9. Using diacritical marks
10. Learning to distinguish facts, opinion and fantasy
11. Locating and organizing information for specific purpose
    a. Use content pages
    b. Use index
    c. Use headings

12. Using table of contents and section title
13. Receiving the author's mood and purpose
14. Interpreting the character's intent and behavior from author's clue
15. Forming opinion
16. Identifying important and unimportant ideas
17. Analyzing conclusions
18. Finding the climax of a story - climax means the height of the problem before it is solved.
19. Determining the plot of the story - the main problem of the story
20. Author's purpose - point of view
21. Summarizing ideas
22. Identifying and evaluating elements of style used by the authors:
    a. Figurative language - language that can not be interpreted word for word.
        i. Metaphor - one kind of object or idea is used in place of another to show likeness e.g. the ship plows the sea.
        ii. Personification - speaking of something that is not a person as though it were. e.g. the trees bowed their heads in silence.
    b. Picturesque language - words that point a picture in a story.
    c. Flashback - breaking the uniformity of sequence by adding events of earlier happenings.
    d. Idiomatic language - a style of expression that is characteristic of an individual, a period of movement e.g. "Well, you can't talk", you have your meal brought in.
    e. Foreshadow - suggesting or pointing out what will happen later in a story. To present beforehand.
    f. Refrain - a regular repeated phrase of verse especially at the end of each stanza or division of poem or song or chorus.
        i. Repetition
        ii. Rhythm
        iii. Rhyme
        iv. Alliteration - each word in a sentence begins with some letter

23. Developing attitudes, habits and interests that characterize the competent reader.
    a. Deciding what the topic of a paragraph is
    b. Encourage reading for purpose
    c. Encourage use of reference material if available
    d. Recognize and select books to satisfy personal interest for specific purpose
    e. Recognize a well-structured plot
    f. Note taking is important
    g. Outlining is stressed
    h. Making judgement

24. Noting function of subheads in an index
25. Integrating new ideas with past experiences
26. Paraphrasing - demanding meaning of what is read
27. Introducing Literary Forms
    a. Poetry
    b. Prose

    1. Non-fiction
        a. Newspaper articles - make children develop the interest of reading our daily news organs
        b. Magazines
        c. Speeches
        d. Essays
        e. Biographies
        f. Autobiographies

EVALUATION

Evaluation is an on-going process of an instructional system. In order for an instructional program to be successful and effective, there should be appropriate pupil-evaluation and teacher-evaluation of materials covering the learning objectives in all areas of the Language Arts Program, at a particular age-grade level.

The evaluation process really starts from the initial time a teacher comes in contact with the students (diagnostic evaluation) to the end (summative evaluation). The record of all evaluations should be kept safely and made available when requested.

Teachers know that, evaluation at the elementary level covers a wide range of experiences and exercises which necessitate the use of a variety of oral and written devices. Therefore a list of suggested evaluation is being included in the curriculum in order to help the teacher in evaluating teaching-learning in the Language Arts Program. The teacher can then devise his/her own strategy as the need arises.

GUIDELINES FOR EVALUATION

Grade V

Pupils will read aloud and interpret what is read. Pupils will also read silently and write interpretation. Teachers can evaluate the outcome of work done separately. Pre-tests are applicable here to test pupils' ability to read. Written evaluation is also necessary for word study. Also the pupil will write opinions or critiques of literature read.

GRADE FIVE

READING REFERENCE AND RESOURCE MATERIALS

1. Trauger, P., Language Arts in Elementary Schools, (McGraw-Hill Inc., London, 1963) Series 5

2. National Council of Teachers of English, English for Today (McGraw-Hill Inc., London, 1963) Series 5

3. Anderson, Freeman B. et al. New Directions in English Series 5 (Harper & Row, Publisher, London, 1969)

4. Gregg. J. C. Evans Primary English for Sierra Leone Book 5 (Evans Brothers Limited, London, 1975)

5. Ogundege, P.A. and Tregidgo P. Sa. Pratical English &(Longman Groups Limited, London, 1977) Series 5

LANGUAGE ARTS CURRICULUM

GRADE SIX

PAGE

TABLE OF CONTENTS 28

OBJECTIVES OF THE ELEMENTARY LANGUAGE ARTS - ENGLISH 29
CURRICULUM 29

General Objectives 29
Specific Objectives 29-30

SCOPE AND SEQUENCE 30

CONTENT AND ACTIVITIES 31-34

EVALUATION 34-36

READING REFERENCE AND RESOURCE MATERIALS 37

OBJECTIVES OF THE ELEMENTARY LANGUAGE ARTS - ENGLISH CURRICULUM

GENERAL OBJECTIVES

The general objectives of the Elementary Language Arts - English Curriculum are to provide for the development of those skills, interests, habits and values which will enable the pupil to:

1. Communicate in English both orally and in written compositions effectively, for example, speak clearly and write legibly.
2. Listen attentively and with understanding (comprehension).
3. Read with ease, speed and comprehension through constant drills and exercises.
4. Appreciate good literature and styles of famous authors through constant exposure to different types of literary forms.
5. Understand the social, cultural, liguistic and ethical environment and observe the role of language as a conveyor of the cultural heritage.
6. Develop socially desirable and courteous speech.
7. Integrate the concepts of the English language into other content areas.
8. Lay foundations of creative writing necessary for continuing education.

SPECIFIC OBJECTIVES

The specific objectives of the Language Arts - English Program are being stated grade-wise in terms of the abilities, skills, interests, and habits to be developed and reinforced at each grade level.

Grade VI

Ability to:

- a. Write paragraphs
- b. Construct written communication
- c. Use correct margin
- d. Listen and comprehend
- e. Recognize phonetics and structure of words.

f. Copy from resource materials such as encyclopedia, dictionary
g. Speak with articulativeness
h. Making speeches
i. Recognize descriptive words in phrases
j. Read
k. Participate in class interactions

Interests and habits needed to:

a. Speak with courtesy
b. Differentiate the types of sentences
c. Develop vocabulary
d. Understand instructions
e. Learn meanings of words
f. Differentiate between singular and plural words
g. Communicate effectively orally and in writing
h. Become exposed to literature and authors
i. Recall information orally

SCOPE AND SEQUENCE CHART

ORAL COMMUNICATION (SPEAKING)

Participate in conversations at home and at school; on the telephone using proper pronunciation in speech.

LISTENING

Listening and participating in poetry; choral speaking discussions and further reinforcement of Grade II.

WRITTEN COMMUNICATION

Extension of Grade III to include: Writing sentences - forms, kinds and parts; Composition - letter writing, writing stories.

READING

Elements and characteristics of reading are not limited to Language Arts but spread over all content areas.

WORD STUDY

Use of the dictionary.

GRADE SIX

READING

Listening, Oral and Written Communication

Language on the level of any grade level should be planned in a systematical way.

Since language is a means of communication, the work of the Sixth Grade level should be designed for the continuous every day growth of pupils in listening, oral and written expressions.

Therefore, the basic part of this section (language) deals with the correct usage of Writen and Oral Communication, and Listening. It would be wise on the part of any teacher to teach these topics with discretion. It is not worthy to mention that handwriting should at all times be corrected.

I. ORAL COMMUNICATION
   A. Using proper pronunciation in speech.
      1. Phonetics
      2. Saying words clearly and distinctly
   B. Discussion and conversation
      1. Difference between discussion and conversation
      2. Conversation on the telephone
      3. Conversation at home
   C. Listening and participating in
      1. Ballads and story poems
      2. Creative mood in poetry
      3. Choral speaking
      4. Making introduction
      5. Giving description
      6. Receiving and giving messages
      7. Preparing for and implementating a Round Table Discussion.
   D. Using the Dictionary

II. WRITTEN COMMUNICATION

A. FUNCTION AND USES OF GRAMMAR

1. Parts of speech
2. Correct usage of parts of speech

B. MORE ABOUT SENTENCES

1. Distinguishing between sentences and sentence fragments
    - (a) Reviewing meaning of a sentence
    - (b) Reviewing sentence fragment
2. Kinds of sentences
    - (a) Sentences according to use
        - i. declarative
        - ii. imperative
        - iii. interrogative
        - iv. exclamatory
    - (b) Sentences according to form
        - i. Simple
        - ii. Compound
        - iii. Complex
        - iv. Compound - Complex
3. Parts of a sentence
    - (a) Subject
        - i. Simple subject
        - ii. Compound
        - iii. Interrogative
        - iv. Exclamatory
    - (b) Predicate
        - i. Simple predicate
        - ii. Complete predicate
4. Position of subject in a sentence
    - (a) Usual and unusual position
    - (b) Subject and verb in interrogative and exclamatory sentences
    - (c) When subject is not given
5. Compound subjects and predicates

C. PARTS OF SPEECH

1. Nouns
    - (a) Definition of nouns
    - (b) Common and proper nouns
    - (c) Cases and genders of nouns
    - (d) Persons and numbers of nouns
2. Pronouns
    - (a) Definition of pronouns (with examples)
    - (b) Kinds of pronouns
    - (c) Cases and genders of pronouns
    - (d) Persons and numbers of pronouns
3. Verbs
    - (a) Kinds of verbs
    - (b) Agreement of verb and subject
    - (c) Using contraction
    - (d) Using negatives correctly
    - (e) Principal parts of verbs
    - (f) Verbs frequently misused
4. Adjectives
    - (a) Adjectives as modifiers
    - (b) Predicate adjectives
    - (c) Proper adjectives
    - (d) Comparison of adjectives
5. Adverbs
    - (a) Adverbs as modifiers
    - (b) Irregular adverbs
    - (c) Comparison of adverbs
    - (d) Other parts of speech - preposition, conjunction, interjection

D. BUILDING GOOD PARAGRAPHS

1. What a paragraph tells about
2. Topic sentences
3. Constructing paragraphs
4. Order in a paragraph

E. WRITTEN REPORTS
  1. Signals
  2. Uses of commas
  3. Quotations
  4. Abbreviations
  5. Uses of capital letters
  6. Writing titles of things you have read
  7. The apostrophe

F. LETTER WRITING
  1. Kinds of letters
  2. Capitalization and punctuation in letters
  3. Writing friendly letters
  4. Writing thank-you letters
  5. Invitations
  6. Business letters
  7. Preparation for mailing

G. WRITING STORIES
  1. What a story is
  2. Getting ideas for original stories

EVALUATION

Evaluation is an on-going process of an instructional system. In order for an instructional program to be successful and effective, there should be appropriate pupil-evaluation and teacher-evaluation materials covering the learning objectives in all areas of the Language Arts Program, at a particular age-grade level.

The evaluation process really starts from the initial time a teacher comes in contact with the students (diagnostic evaluation) and proceeds through the entire learning process (formative evaluation) to the end (summative evaluation). The record of all evaluations should be kept safely and made available when requested.

Teachers know that, evaluation at the elementary level covers a wide range of experiences and exercises which necessitate the use of a variety of oral and written devices. Therefore a list of suggested evaluation is being included in the curriculum in order to help the teacher in evaluating teaching-learning in the Language Arts Program. The teacher can then devise his/her own strategy as the need arises.

GUIDELINE FOR EVALUATION

Grade VI

Pupil will apply concepts of speech and other oral communication to reading. Evaluation - written - will be made of the use of the dictionary and grammar. Oral evaluation here is made primarily for pupil's enrichment and serve as a guide to the teacher while making subjective evaluation.

NOTE: At all levels the teacher must be alert enough to make some subjective evaluation as well.

EVALUATION DEVICES

- A Brief Explanation -

1. Pre-tests:
   Taken from the textbook series in which the pupil or pupils will be instructed for appraising capability and achievement before choosing materials and beginning instruction. The selection from each book may be presented one from the beginning, one from the middle and one from near the end.
2. Teacher-Made Class-room Tests:
   After students have covered a unit, some units or one subject area a teacher can make up a test out of the covered content and from pupil's daily exercises.
3. Homework:
   Students may be assigned some homework to be turned in on any given day. A record of the exercises thus completed by the student may also be used in the construction of terminal tests
4. Vocabulary Inventories and Record keeping:
   An inventory of the pupil's vocabulary should be kept as a diagnostic information to indicate the pupil's progress.
5. Student Self-Evaluation:
   This is appropriate only for the upper elementary level. Teachers should devise a workable technique for student's self-evaluation.

6. Standardized Tests (if available)

Mostly group tests that will measure the students' vocabulary and comprehension in Language and Literature.

7. Teacher Self-Evaluation:

By constructing a suitable scale to evaluate his/her own teaching strategy, materials and activities used to achieve specified objectives in a program or classroom situation, the teacher learns how to improve his/her instruction.

READING REFERENCE AND RESOURCE MATERIALS

1. Trauger, P., *Language Arts in Elementary Schools*, (McGraw-Hill Inc., London, 1963) Series 6

2. National Council of Teachers of English, *English for Today* (McGraw-Hill, Inc., London, 1963) Series 6

3. Anderson, Freeman B. et. al *New Directions in English* Series 6 (Harper & Row, Publisher, London, 1969)

4. Gogg. J.C. *Evans Primary English for Sierra Leone* Book 6 Brothers Limited, London, 1975)

5. Moore, Bai T. *Ebony Dust* (International Copyright Convention, 1963)

6. Ogundege, P.A. and Tregido, P.S. *Practical* English & (Longman Groups Limited, London, 1977) Series 6

ANALYZING THE RESULTS

To make optimum use of the instrument as a planning guide, look first at the Inventory Profile to see which key competency areas you would like to improve. It is also helpful to check the Answer Key to determine which specific competencies within a key competency appear to require special attention. Based on your perception of where you are in relation to where you would like to be for each competency area, select those professional activities which will help bring the two together.

INVENTORY OF ADULT EDUCATOR COMPETENCIES

TO WHAT DEGREE DO I as a teacher of adults . . .

1. Use the services of national, state, and local agencies responsible for adult education.
2. Diagnose entry knowledge and skill of adult learners for a given set of instructional objectives.
3. Develop effective working relationships with adult learners (approachable, friendly, responsive, and supportive).
4. Provide opportunity for adult learners to participate in curricular evaluation.
5. Utilize community resources in the classroom.
6. Communicate in a coherent and logical manner.
7. Utilize sequential, relevant short-range instructional objectives.
8. Utilize the services of available adult education advisory committees.
9. Provide for self-evaluation.
10. Understand the interrelationship of the school and community in providing for adult education.
11. Recognize processes involved in community change.

TO WHAT DEGREE DO I as a teacher of adults . . .

12. Assist adult learners in developing positive self-concepts by designing success opportunities for each learner.

13. Demonstrate commitment to lifelong learning for self and others.

14. Identify an individual's experiences and interests, and relate them to his growth as an adult learner.

15. Provide a suitable environment for adult learning.

16. Use an appropriate system for keeping records of class and individual progress.

17. Continue professional growth.

18. Implement the unique role of an adult educator.

19. Participate actively in professional adult education organizations.

20. Differentiate between curricula and instruction when selecting curricula and developing instructional plans.

21. Identify potential employment or on-the-job training opportunities within the community.

22. Comprehend national, state, and local objectives of adult education.

23. Help adult learners adapt to change.

24. Refer adult learners to community agencies for specific educational and training needs.

25. Select curricula to assist adults to develop and use learning skills.

26. Apply basic principles of group dynamics and leadership techniques.

27. Identify available resource personnel and services for the design of curricula.

28. Identify the major functions of community agencies which serve the social, educational, and training needs of adult learners.

29. Write learning objectives with measurable outcomes.

30. Apply instructional techniques which utilize talents, abilities, and experiences of group members.

31. Select curricula which assists adult learners to continue formal education.

32. Relate learning to immediate application.

TO WHAT DEGREE DO I as a teacher of adults . . .

33. Encourage the adult learner's growth through supportive communication.

34. Assess learning needs of adult learners.

35. Construct sequential, relevant short-range learning objectives.

36. Assist adult learners in developing problem-solving skills.

37. Apply knowledge of group dynamics to assist students in interacting constructively with peers.

38. Talk and act enthusiastically about my program.

39. Use techniques of public relations in school and community.

40. Utilize knowledge of the social structure and characteristics of the community.

41. Assist learners who desire to assume new roles in society.

42. Select curricula which stimulates a higher level of aspiration in the adult learner.

43. Develop appropriate goals and objectives for adult programs.

44. Provide practical activities for learning which reinforce instruction.

45. Attend conventions and conferences relevant to my professional growth.

46. Use reinforcement techniques.

47. Establish a basis for mutual respect with adult learners.

48. Enroll in college courses for professional growth.

49. Use sociometric techniques to enhance classroom learning.

50. Demonstrate instructional skills which assist adult learners in relating with peers.

51. Select curricula which meet individual personal interests of adult learners.

52. Select curricula according to appropriate sequence, continuity, and integration.

53. Use social skills which assist adult learners in developing a positive self-concept.

TO WHAT DEGREE DO I as a teacher of adults . . .

54. Use instructional skills which assist adult learners in developing a positive self-concept.

55. Understand the role of adult education within the community.

56. Apply adult learning theory to the process of program development.

57. Assist adult learners who desire to assume new roles in society.

58. Use criteria-based assessment procedures.

59. Use instructional methods with special relevance to and effectiveness for adult learners.

60. Facilitate individual adjustment to the changing nature of our society.

61. Read professional literature.

62. Maintain interest of adult learners in educational activities.

63. Identify and utilize available resource personnel and services.

64. Communicate effectively with adult learners.

65. Select curricula for varying ability levels.

66. Develop and organize curricula reflecting needs, interests, expectations, and abilities of adult learners.

67. Respond positively to constructive criticism by making appropriate changes.

68. Select conditions which facilitate adult learning.

69. Guide and facilitate self-directed learning in the adult learner.

70. Provide continuous feedback to adult learners on their educational progress.

71. Recognize symptoms of physical deficiencies that may be related to adult learning.

72. Relate effectively to people who come from a variety of cultural, economic, and occupational backgrounds.

73. Adjust instructional techniques to meet the immediate learning needs of adult learners.

74. Identify the major topics and concepts of each subject taught.

75. Help adults to set their goals.

TO WHAT DEGREE DO I as a teacher of adults . . .

76. Reinforce positive attitudes toward adult learning.

77. Recognize signs of the potential adult dropout.

78. Explain the role of adult education to both the school and community.

79. Select curricula which assists adult learners to acquire employment skills.

80. Select objectives from each of the domains (cognitive, psychomotor, and affective).

81. Relate adult developmental characteristics (sociological, psychological, and physiological) to curricula selection.

82. Demonstrate behaviors which reflect a feeling for the dignity and worth of the individual.

83. Assist adult learners to develop positive attitudes towards lifelong learning.

84. Utilize the resources of the power structure of the community.

85. Participate in adult education staff development programs.

86. Employ acceptable techniques for modifying inappropriate behavior.

87. Interact constructively with adults.

88. Assist adult learners in acquiring the social skills of relating with peers.

ANSWER SHEET (1-44)

DEGREES OF COMPETENCY:

I. Have a slight degree of competency; a definite need for improvement.
II. Have some degree of competency; need for improvement.
III. Have a moderate degree of competency; some need for improvement.
IV. Have a high degree of competency; may need improvement.

DIRECTIONS: CIRCLE THE APPROPRIATE ARABIC NUMERAL FOR EACH ITEM ACCORDING TO THE DIRECTIONS AT THE BEGINNING OF THE INVENTORY.

ITEM NO.	I	II	III	IV	ITEM NO.	I	II	III	IV
1.	1-2-3	4-5-6	7-8-9	10-11-12	23.	1-2-3	4-5-6	7-8-9	10-11-12
2.	1-2-3	4-5-6	7-8-9	10-11-12	24.	1-2-3	4-5-6	7-8-9	10-11-12
3.	1-2-3	4-5-6	7-8-9	10-11-12	25.	1-2-3	4-5-6	7-8-9	10-11-12
4.	1-2-3	4-5-6	7-8-9	10-11-12	26.	1-2-3	4-5-6	7-8-9	10-11-12
5.	1-2-3	4-5-6	7-8-9	10-11-12	27.	1-2-3	4-5-6	7-8-9	10-11-12
6.	1-2-3	4-5-6	7-8-9	10-11-12	28.	1-2-3	4-5-6	7-8-9	10-11-12
7.	1-2-3	4-5-6	7-8-9	10-11-12	29.	1-2-3	4-5-6	7-8-9	10-11-12
8.	1-2-3	4-5-6	7-8-9	10-11-12	30.	1-2-3	4-5-6	7-8-9	10-11-12
9.	1-2-3	4-5-6	7-8-9	10-11-12	31.	1-2-3	4-5-6	7-8-9	10-11-12
10.	1-2-3	4-5-6	7-8-9	10-11-12	32.	1-2-3	4-5-6	7-8-9	10-11-12
11.	1-2-3	4-5-6	7-8-9	10-11-12	33.	1-2-3	4-5-6	7-8-9	10-11-12
12.	1-2-3	4-5-6	7-8-9	10-11-12	34.	1-2-3	4-5-6	7-8-9	10-11-12
13.	1-2-3	4-5-6	7-8-9	10-11-12	35.	1-2-3	4-5-6	7-8-9	10-11-12
14.	1-2-3	4-5-6	7-8-9	10-11-12	36.	1-2-3	4-5-6	7-8-9	10-11-12
15.	1-2-3	4-5-6	7-8-9	10-11-12	37.	1-2-3	4-5-6	7-8-9	10-11-12
16.	1-2-3	4-5-6	7-8-9	10-11-12	38.	1-2-3	4-5-6	7-8-9	10-11-12
17.	1-2-3	4-5-6	7-8-9	10-11-12	39.	1-2-3	4-5-6	7-8-9	10-11-12
18.	1-2-3	4-5-6	7-8-9	10-11-12	40.	1-2-3	4-5-6	7-8-9	10-11-12
19.	1-2-3	4-5-6	7-8-9	10-11-12	41.	1-2-3	4-5-6	7-8-9	10-11-12
20.	1-2-3	4-5-6	7-8-9	10-11-12	42.	1-2-3	4-5-6	7-8-9	10-11-12
21.	1-2-3	4-5-6	7-8-9	10-11-12	43.	1-2-3	4-5-6	7-8-9	10-11-12
22.	1-2-3	4-5-6	7-8-9	10-11-12	44.	1-2-3	4-5-6	7-8-9	10-11-12
ITEM NO.	I	II	III	IV	ITEM NO.	I	II	III	IV

ANSWER SHEET (ITEMS 45-88)

DEGREES OF COMPETENCY:

I. Have a slight degree of competency; a definite need for improvement.
II. Have some degree of competency; need for improvement.
III. Have a moderate degree of competency; some need for improvement.
IV. Have a high degree of competency; may need improvement.

DIRECTIONS: CIRCLE THE APPROPRIATE ARABIC NUMERAL FOR EACH ITEM ACCORDING TO THE DIRECTIONS AT THE BEGINNING OF THE INVENTORY.

ITEM NO.	I	II	III	IV	ITEM NO.	I	II	III	IV
45.	1-2-3	4-5-6	7-8-9	10-11-12	67.	1-2-3	4-5-6	7-8-9	10-11-12
46.	1-2-3	4-5-6	7-8-9	10-11-12	68.	1-2-3	4-5-6	7-8-9	10-11-12
47.	1-2-3	4-5-6	7-8-9	10-11-12	69.	1-2-3	4-5-6	7-8-9	10-11-12
48.	1-2-3	4-5-6	7-8-9	10-11-12	70.	1-2-3	4-5-6	7-8-9	10-11-12
49.	1-2-3	4-5-6	7-8-9	10-11-12	71.	1-2-3	4-5-6	7-8-9	10-11-12
50.	1-2-3	4-5-6	7-8-9	10-11-12	72.	1-2-3	4-5-6	7-8-9	10-11-12
51.	1-2-3	4-5-6	7-8-9	10-11-12	73.	1-2-3	4-5-6	7-8-9	10-11-12
52.	1-2-3	4-5-6	7-8-9	10-11-12	74.	1-2-3	4-5-6	7-8-9	10-11-12
53.	1-2-3	4-5-6	7-8-9	10-11-12	75.	1-2-3	4-5-6	7-8-9	10-11-12
54.	1-2-3	4-5-6	7-8-9	10-11-12	76.	1-2-3	4-5-6	7-8-9	10-11-12
55.	1-2-3	4-5-6	7-8-9	10-11-12	77.	1-2-3	4-5-6	7-8-9	10-11-12
56.	1-2-3	4-5-6	7-8-9	10-11-12	78.	1-2-3	4-5-6	7-8-9	10-11-12
57.	1-2-3	4-5-6	7-8-9	10-11-12	79.	1-2-3	4-5-6	7-8-9	10-11-12
58.	1-2-3	4-5-6	7-8-9	10-11-12	80.	1-2-3	4-5-6	7-8-9	10-11-12
59.	1-2-3	4-5-6	7-8-9	10-11-12	81.	1-2-3	4-5-6	7-8-9	10-11-12
60.	1-2-3	4-5-6	7-8-9	10-11-12	82.	1-2-3	4-5-6	7-8-9	10-11-12
61.	1-2-3	4-5-6	7-8-9	10-11-12	83.	1-2-3	4-5-6	7-8-9	10-11-12
62.	1-2-3	4-5-6	7-8-9	10-11-12	84.	1-2-3	4-5-6	7-8-9	10-11-12
63.	1-2-3	4-5-6	7-8-9	10-11-12	85.	1-2-3	4-5-6	7-8-9	10-11-12
64.	1-2-3	4-5-6	7-8-9	10-11-12	86.	1-2-3	4-5-6	7-8-9	10-11-12
65.	1-2-3	4-5-6	7-8-9	10-11-12	87.	1-2-3	4-5-6	7-8-9	10-11-12
66.	1-2-3	4-5-6	7-8-9	10-11-12	88.	1-2-3	5-6	7-8-9	10-11-12
ITEM NO.	I	II	III	IV	ITEM NO.	I	II	III	IV

ANSWER KEY

DIRECTIONS:

1. Consult the Answer Key below. Starting with Column 1 (Key Competency #1), locate the items listed (in this case, Items 13, 18, 22, 55 and 78) on your two Answer Sheets and for each item enter the Arabic numeral (1-12) which you circled.
2. Total each column and divide the sum by the number of items in the column (rounding to the nearest whole number). This will determine the average for that key competency.
3. Turn to the Inventory Profile sheet. Enter the average for each key competency by inserting checkmarks in the appropriate boxes.
4. The 12th column represents a summary of the 11 key competencies, which were included as items on the inventory.

KEY COMPETENCY #

#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	EXAMPLE
13	1	41	6	2	12	15	17	3	4	25	10	1 6
18	5	50	7	9	14	23	19	37	20	29	17	21 9
22	8	53	26	16	33	32	45	47	27	35	34	40 5
55	10	54	30	34	72	38	48	49	31	43	43	63 4
78	11	60	36	58	82	57	61	64	42	75	55	71 3
	21	88	44	70		68	85	67	51	80	59	77 9
	24		46	71		76		87	52		60	
	28		59			77			56		66	
	39		62			83			63		68	
	40		69						65		82	
	84		73						66		87	
			86						74			
									79			
									81			
5/	11/	6/	12/	7/	5/	9/	6/	7/	14/	6/	11/	6 6/ 36

INVENTORY PROFILE

DIRECTIONS: Working from the Answer Key, enter the average for each key competency by inserting checkmarks in the appropriate boxes.

KEY COMPETENCIES OF ADULT EDUCATORS		I			II			III			IV	
	1	2	3	4	5	6	7	8	9	10	11	12
1. Understands the role of adult education within the community.												
2. Understands the interrelationship of the school and community in providing adult education.												
3. Facilitates individual adjustment to the changing nature of our society.												
4. Uses instructional methods with special relevance and effectiveness with adults.												
5. Assesses learning needs of students.												
6. Demonstrates behaviors which reflect a feeling for the dignity and worth of the individual.												
7. Understands conditions and motivations which affect adult learning.												
8. Is willing to continue professional growth.												
9. Interacts constructively with adults.												
10. Develops and organizes curricula reflecting needs, interests, expectations, and abilities of adult participants.												
11. Develops appropriate goals and objectives for adult programs.												
12. Key competency summary.												

INVENTORY PROFILE

DIRECTIONS: Working from the Answer Key, enter the average for each key competency by inserting checkmarks in the appropriate boxes.

KEY COMPETENCIES OF ADULT EDUCATORS		I			II			III			IV	
	1	2	3	4	5	6	7	8	9	10	11	12
1. Understands the role of adult education within the community.												
2. Understands the interrelationship of the school and community in providing adult education.												
3. Facilitates individual adjustment to the changing nature of our society.												
4. Uses instructional methods with special relevance and effectiveness with adults.												
5. Assesses learning needs of students.												
6. Demonstrates behaviors which reflect a feeling for the dignity and worth of the individual.												
7. Understands conditions and motivations which affect adult learning.												
8. Is willing to continue professional growth.												
9. Interacts constructively with adults.												
10. Develops and organizes curricula reflecting needs, interests, expectations, and abilities of adult participants.												
11. Develops appropriate goals and objectives for adult programs.												
12. Key competency summary.												

It should be noted that it would be possible to modify the system so that a meter or meters replaced the pairs of lights. However, it was felt that for the purposes for which we used the system, the light displays would be more impactful. Modification for the use of meters would not substantially affect the cost of the system.

The system described above has been used in a variety of instructional settings. In general, however, it has been used differently than the system described by Littauer (1972). Littauer described an application directed toward evaluating the degree to which the presented material has been mastered. (This system may also be used for such a purpose, although a system with only two response classes may not be as effective.) The system has been used mainly to provide an additional communication channel from the students to the instructor.

It is our belief that providing the students with an anonymous (and consequently "safe") method of communication with the instructor can serve to make the class more personal and meaningful to the student. We decided to concentrate on student-to-instructor communication, since the instructor typically has greater opportunities to communicate to—and influence—the student than vice versa.

To date, we have used the red and green lights to signify several dimensions, including, "understand—don't understand"; "exciting—dull"; "talking at a good speed—taking too fast or too slow." It is, of course, possible to define many other dichotomous dimensions for which the channels could be used.

It has been mentioned that the use of green and red lights creates a more impactful visual display than can be achieved through the use of meters. This is probably partly a function of the learning history of green and red lights in the environment. Suffice it to say that the first time the console begins to glow red, it is a rather intimidating experience.

It is not difficult to imagine a system such as the one described here finding broad use in the educational process. It could be used, either alone or in conjunction with a videotape recorder (see Klingstedt, 1972), as an aid in teacher self-evaluation and improvement and in teacher training. (Research is also being planned to evaluate the use of the system in leadership training.) □

References

Klingstedt, J.L. Technology Aids Self-Evaluation. *Educational Technology*, October 1972, *12* (10), 73.

Littauer, R. Instructional Implications of a Low-Cost Electronic Student Response System. *Educational Technology*, October 1972, *12* (10), 69-71.

Ten Functions of an Instructional System

James A. Robb

Instructional systems discussions have become more popular since the pressures of accountability have been felt—and yet there is no common definition. Ten functions of an instructional system are offered as additional "food for thought" in the effort toward improving instruction.

Any system involving directed change or progress may be divided into a minimum of three basic phases: (1) Plan, (2) Execute and (3) Evaluate. These phases are used as a base in designing an instructional system. These phases—and the 10 basic functions or steps—are charted in Figure 1.

Phase I: Planning

The first five functions are associated essentially with the planning activity of an instructional system. That is, every student should have appropriate guidance in planning his objectives. These five functions are a part of that planning.

1. The knowledge, skills, cognitive style, talents, values and motivation of a student should be assessed and the findings shared with the student. He and his teachers and/or advisors should plan for optimum achievement.

2. With a good general understanding of himself and also of the knowledge and skills required in a variety of areas, reasonable learning objectives can be selected by any student.

3. In some cases, a number of necessary requirements or skill objectives have already been accomplished and appropriate credit should be awarded.

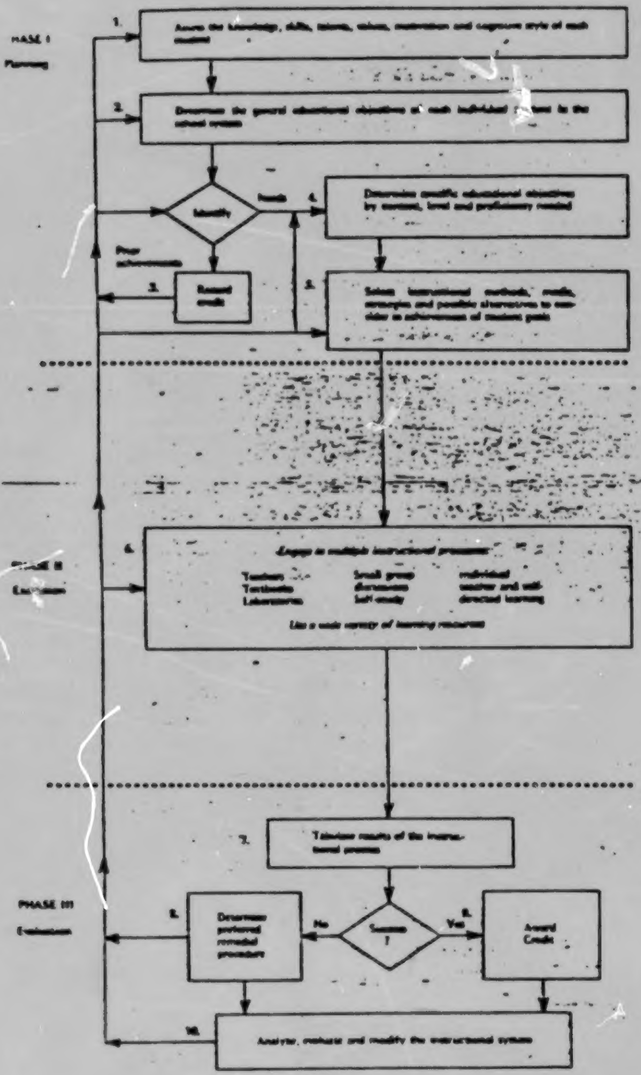
4. Specific instructional objectives should be determined that would provide the student with the required education. The approximate level of competence of each topic should be determined. Further, the selection of instructional methods and learning resources should be made in keeping with the type of learning and the cognitive style of the student being advised.

5. The strategies and possible alternatives in attaining the instructional goals need to be determined. Selections must be made of the most appropriate methods of instruction and the media preferred for each student.

James A. Robb is Supervisor of Electronic Data Processing, Southern Illinois University, Carbondale.

Figure 1

Ten Functions of an Instructional System



PHASE I
Planning
1.
2.
Identify
Needs
4.
Prior achievements
3.
Record credit
5.
6.
Engage in multiple instructional processes
Teachers
Textbooks
Laboratories
Small group discussions
Self-study
Individual teacher and self-directed learning
Use a wide variety of learning resources
7.
Tabulate results of the instructional process
PHASE III
Evaluation
8.
Determine preferred remedial procedure
No
Success ?
Yes
9.
Award Credit
10.
Analyze, evaluate and modify the instructional system

Phase II: Execution

When each student has developed what seems to be a reasonable plan for reaching his educational objectives, he is ready to participate in the selected learning activities. Function six identifies several choices open to him.

6. An instructional system should provide each student with the opportunity to participate in a wide variety of learning activities. It should include instructional processes involving conventional teachers and textbooks, small group discussions and many forms of individualized instruction. This enables each student to strive for his educational objectives using methods well suited to his cognitive style.

Phase III: Evaluation

Feedback from the various activities must be collected and analyzed. The evaluation phase of any process or system is essential in planning for the future of the system.

7. Frequent self-evaluation of achievement must be made by each student with periodic evaluation and guidance from a teacher/advisor.

8. Areas of inadequate proficiency should be quickly identified and carefully analyzed. The cause of the problem should be determined and an appropriate remedial procedure promptly started. Perhaps the fault will be found in the evaluation process rather than in the instructional process, or a change in instructional objectives or methods is indicated. Possibly a new counseling session should be scheduled. Thus, from Step 8 a student could be routed back to any point in the system.

9. Appropriate credit is awarded upon the successful completion of each instructional unit.

10. The total instructional system must have a built-in, continuous, comprehensive evaluation system. A careful analysis of each function of the system must be made and evaluated. This type of feedback is essential in order to properly modify the instructional system and maintain a high level of operating efficiency.

Summary

These 10 functions are not performed effectively by all instructional systems. In many cases, especially in a post-secondary school system, most of the effort is concentrated in Steps (4) and (6), and they are not sufficiently comprehensive to accommodate many of the students. Each instructional system should be designed to include *all* 10 functions in proper balance. Any function that is neglected will weaken the entire system. ☐

Attention: Prospective Book Authors

Educational Technology Publications, publisher of this magazine, seeks high-quality manuscripts for release through its book division.

Book-length manuscripts are welcome on all aspects of educational technology. The firm has published more than five dozen original books since 1970.

Study Sheet

III - B

TAXONOMY/CLASSIFICATIONS

COGNITIVE

Evaluation
Synthesis
Analysis
Application
Comprehension
Knowledge

AFFECTIVE

Characterization
Organization
Value
Respond
Receive

PSYCHOMOTOR

Naturalization
Articulation
Precision
Manipulation
Imitation

THE TAXONOMY OF EDUCATIONAL OBJECTIVES

KEY WORDS

Cognitive Domain

Evaluation - judge, argue, validate, assess, compare, contrast, appraise, standardize

Synthesis - write, tell, relate, produce, transmit, originate, modify, document, propose, design, combine, organize, synthesize, formulate

Analysis - distinguish, detect, identify, classify, discriminate, recognize, categorize, deduce, analyze, contrast, compare, distinguish

Application - apply, generalize, relate, choose, organize, use, employ, transfer, restructure, classify

Comprehension - translate, transform, illustrate, prepare, read, represent, change, rephrase, restate, interpret, reorder, rearrange, differentiate, demonstrate, explain, estimate, infer, conclude, differentiate, extend

Knowledge - define, distinguish, acquire, identify, recall, recognize

Affective Domain

Receiving - differentiate, separate, set apart, share, accumulate, select, combine, listen (for), control

Responding - comply, follow, commend, approve, volunteer, discuss, practice, applaud, acclaim, spend leisure time in, augument

Valuing - assist, subsidize, support, deny, protest, debate, argue

Organization - discuss, theorize, abstract, compare, balance, organize, formulate (systems, approaches, criteria, limits)

Characterization - revise, change, complete (plans, behavior methods) be rated highly... (integrity, ethics, maturity, etc.)

Figure 1

INVENTORY OF FUNCTIONAL COMPETENCES

Psychomotor (Things)	Informational (Data)		Interpersonal (People)	
	Level I	Level II		
Setting-up Precision working Operating Driving Manipulating Constructing Assembling Connecting Tending Handling Measuring Weighing Feeding	Recalling Retaining Storing Recording Recognizing	Creating • evaluating • valuing Predicting Synthesizing Coordinating • conceptualizing • integrating • formulating • defining • categorizing • reflecting Analyzing • extrapolating • interpreting • deducing • assuming • inducing • describing • translating • differentiating • investigating Observing • identifying	Mentoring • counseling • advising • guiding • interviewing • strategy planning Managing • producing • administering • directing • chairing • coordinating • organizing • programming • planning • designing Leading • motivating • controlling • manipulating • determining Negotiating • renegotiating • finalizing • resolving • bargaining • reconciling • arbitrating • facilitating • recommending Instructing • training • teaching • reinforcing • testing • explaining • demonstrating • presenting	Supervising • determining • interpreting • assigning • maintaining Consulting • advising • clarifying • discussing • reporting • conferring Persuading • coaching • advocating • influencing • molding • advising Communicating • speaking • interviewing • writing • responding • signaling • listening • stimulating • conning • manipulating Entertaining • dancing • singing • acting • story-telling • miming Serving Helping

Appendix C
Specific Interpersonal Behaviors

Mentoring

- listens
- asks questions
- reflects feeling and informational responses
- guides conversation
- diagnoses and evaluates feelings and information
- feeds back diagnoses
- makes suggestions
- prescribes treatments and approaches to solving problems
- instructs: presents information, explains, gives examples
- forecasts possible outcomes, predicts consequences of alternative courses of action
- gives assurances and support
- motivates
- persuades and influences in favor of a point of view
- provides feedback and evaluation of progress
- makes new suggestions based on new information or circumstances

Managing

sets goals and performance standards

establishes communication channels

promotes the free flow of two-way communication

formulates policies and directs their implementation

coordinates tasks, activities, and programs

plans conferences

makes decisions on personnel matters

provides evaluation of progress

prescribes alternative approaches to solving problems

administers and implements the policies of supervisors

allows others to lead

takes responsibility for duties and tasks under jurisdiction

Leading

establishes and implements performance standards

sets group priorities

persuades and influences in favor of a point of view

promotes group trust and cohesion

motivates

employs authority to accomplish goals through cooperation of group

maintains group harmony

controls group behavior through use of sanctions and punishments

determines the direction of the group

makes decisions on policy and procedures

solves problems by invoking symbols of his or her authority

Negotiating

- states and argues position
- bargains over terms
- instructs: presents information, explains, and gives examples
- advances proposals
- defends position with clear and coherent rationale
- answers objections
- presents alternative courses of action
- gives and takes in a trade-off of benefits
- argues against counterproposals
- discusses possible solutions
- defines goals and objectives
- offers counterproposals when original proposals are rejected
- reconciles opposing viewpoints
- confronts opposing demands to clarify positions

Instructing

- listens to opinions and ideas
- presents lectures
- elicits and discusses theories and practices
- trains others in affective and cognitive principles
- uses demonstration and role-playing techniques to teach subject matter
- conducts seminars and workshops
- illustrates theories and principles through explanation and example
- tests and assesses knowledge and understanding of the problem-solving process
- answers questions
- points out similarities and differences of viewpoints
- makes inferences about the cognitive behaviors of others

Supervising

- assigns tasks
- discusses subordinates' use of discretion
- explains operating procedure
- implements performance standards
- examines task outcome against stated criteria
- directs studies
- evaluates performance
- interprets results of task performance
- judges content and consequences of discretionary decisions
- sets task objectives
- assesses individual competence to perform a given task
- ensures performance standards necessary to achieve objectives

Consulting

- gives information and ideas based on experience and training
- recommends content and methods of training
- provides sources of technical information
- gives ideas to define and clarify procedures and product specifications
- informs on details of working out objectives
- gives advice
- explains content of programs
- assists in working out of plans
- guides implementation of plans
- meets with, listens, discusses and answers questions to resolve problems and promote cooperation
- makes suggestions to reduce resistance and sharpen understanding of program goals
- recommends alternative courses of action

Persuading

- describes and explains advantages and benefits of a program
- converses with clients
- influences in favor of a service, product, or point of view
- demonstrates the advantages of programs, procedures, products, ideas, and services
- speaks and converses with individuals, groups, and organizations
- coaxes individuals to elaborate on thoughts and feelings
- gives instruction, advice, and personal assistance

Entertaining

- tells stories and anecdotes
- selects and narrates jokes
- plays games
- gives support and assurances
- expresses sympathy
- sings songs
- acts in dramatic roles
- acts out a mime part

Public Schools of the District of Columbia
REGION VI
Bunker Hill C/SD Center
14th & Michigan Ave., N.E.
Washington, D.C. 20017

MOD 3
PT 1

SAMPLE FORM FOR INSTRUCTIONAL PLANNING

Name: ______________________________

Date: ____________________ School: ____________________ School Year: __________

Position: ____________________________ Subject/Grade Level: ____________

I. BEHAVIORAL OBJECTIVES	II. INSTRUCTIONAL ACTIVITIES	III. ASSESSMENT TASKS

Instructor's Lesson Plan

Related Technical Information

Unit ______
Lesson ______

SUBJECT

AIM (OR PURPOSE):

TEACHING AIDS:

MATERIALS:

REFERENCES:

I. PREPARTION (OF the LEARNER)

II. PREPARTION (OF the Information)

Instructional Topics	Things to Remember to Do or Say
	CONTINUED

(Additional blank sheets can be ruled into two columns for notes for presentation step

PRESENTATION, continued

Instructional Topics	Things to Remember to Do or Say

III. APPLICATION (drills, illustrations, analogies, oral questions or assignments)

IV. TEST (final check on students' comprension of material presented).

Suggested Reading for Student:

The Next Lesson Is:

LNE/SH. 1978

Booklet No. __________

667

WEST AFRICAN EXAMINATIONS COUNCIL
LIBERIAN NATIONAL EXAMINATION
SENIOR HIGH SCHOOL

MATHEMATICS & SCIENCE

GENERAL INSTRUCTIONS

1. THERE ARE TWO TESTS IN THIS BOOKLET. YOU MUST ANSWER ALL THE QUESTIONS IN EACH TEST.

2. THERE IS A SET TIME FOR EACH TEST. YOU MAY ONLY WORK ON THE QUESTIONS OF A PARTICULAR TEST DURING THE TIME ALLOWED FOR THAT TEST. IF YOU FINISH A TEST BEFORE TIME IS UP, CHECK YOUR ANSWERS CAREFULLY. YOU ARE NOT ALLOWED TO START THE NEXT TEST UNTIL YOU ARE TOLD TO DO SO.

3. YOUR ANSWERS MUST BE MARKED IN PENCIL ON THE SEPARATE ANSWER SHEET PROVIDED.

4. FOR EACH ANSWER YOU MARK, MAKE SURE THAT THE NUMBER ON THE ANSWER SHEET AGREES WITH THE QUESTION YOU WISH TO MARK.

5. THERE ARE SEPARATE INSTRUCTIONS AT THE BEGINNING OF EACH TEST. READ THEM CAREFULLY BEFORE ANSWERING THE QUESTIONS.

6. DO ALL YOUR ROUGH WORK IN THE BOOKLET.

C 1978 West African Examinations Council

MATHEMATICS - Test Code: 13

Time Allowed: 1 hr 15 mins

Directions: In this test there are 50 questions and each question has four answers labelled A - D. Only one of the answers is correct. Blacken the space bearing the same letter as the correct answer, on your answer sheet. Mathematics is Test 13 so the section of the answer sheet headed Test 13 should be used.

✓1. Express 432 as a numeral in base seven.

A. 4324_{seven}

B. 4424_{seven}

C. 2924_{seven}

D. 1155_{seven}

2. Simplify: $\sqrt{18} - \sqrt{72} + \sqrt{50}$

A. $\sqrt{2}$

B. $-\sqrt{2}$

C. $-2\sqrt{2}$

D. $2\sqrt{2}$

3. What is the square root of 0.001296?

A. 0.36
B. 0.036
C. 0.0036
D. 0.00036

✓4. A car travelling at an average speed of 50 miles an hour left Monrovia for Kakata; 30 minutes later, another car travelling at an average speed of 55 miles an hour started on the same route to Kakata. How soon will the second car over-take the first?

A. 4 hours
B. 4½ hours
C. 5 hours
D. 5½ hours

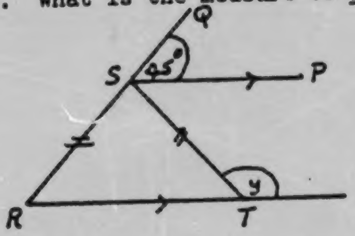
5. Solve for x in $\sqrt{3x-2} = 4$

A. 4
B. 5
C. −6
D. 6

6. If $P(x) = x^3 - 5x - 2$, what is $P(-2)$?

A. 0
B. 4
C. 11
D. 16

7. In the given figure, RST is an isosceles triangle, SP//RT and $\angle PSQ = 45°$. What is the measure of $\angle y$?



A. 35°
B. 45°
C. 65°
D. 135°

8. Rationalize the denominator of $\left(\frac{3}{\sqrt{5} - \sqrt{2}}\right)$ and simplify.

A. $3(\sqrt{5} - \sqrt{2})$

B. $(\sqrt{5} + \sqrt{2})$

C. $\sqrt{3}$

D. 1

9. The area of $\triangle XYZ$ is 6.25 sq.in., and the height XT = 2.5 in. Calculate YZ

A. 2.5 in
B. 3.75 in
C. 5 in
D. 6.5 in

10. If $\tan x = \frac{4}{3}$, what is the value of $\sin x + \cos x$?

A. $\frac{7}{3}$ C. $\frac{7}{9}$

B. $\frac{7}{5}$ D. $\frac{8}{9}$

GO ON TO THE NEXT PAGE:-

11. What is the slope of the line represented by the equation $2x + 3y = 6$?

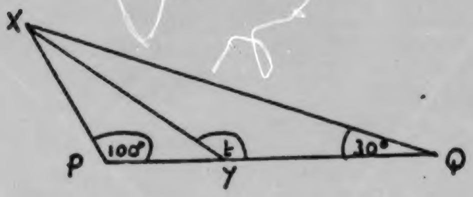
A. $-\frac{2}{3}$

B. $-\frac{3}{2}$

C. -3

D. 3

✓ 12. In the given figure, $\angle P = 100^\circ$ $\angle Q = 30^\circ$ and XY bisects $\angle X$. What is the measure of $\angle t$?



A. 25°

B. 55°

C. 100°

D. 125°

13. Fatu receives 5% commission on all sales. If her commission last month was $122.50, what were her sales for the month?

A. $2,450.00
B. $735.00
C. $612.00
D. $490.00

14. Mr. Flomo invests $240.00 for 3 years and receives $18.00 simple interest. At what rate per cent was the money invested?

A. 4%
B. $3\frac{1}{2}$%
C. $2\frac{1}{2}$%
D. $\frac{2}{5}$%

15. Simplify: $12^0 - 4^{\frac{1}{2}} - \left(\frac{1}{27}\right)^{-\frac{2}{3}}$

A. -11
B. 1
C. -10
D. 5

16. Which of the following is equivalent to

$$(3x^6)^{-2} \ ?$$

A. $-9x^{-2}$

B. $\frac{1}{9}x^{-12}$

C. $9x^{-12}$

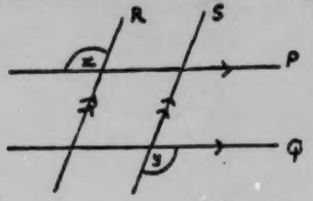
D. $\frac{1}{9}x^4$

17. The map of a rectangular airfield is exactly 6 in long and 2 in wide. If the scale of the map is 1 inch to $\frac{1}{2}$ a mile, what is the area of the airfield in square miles?

A. 3 sq. miles
B. 4 sq. miles
C. 6 sq. miles
D. 8 sq. miles

18. In the given figure P//Q and R//S, $\angle x = 125^\circ$. What is the measure of $\angle y$?

A. 135°
B. 125°
C. 55°
D. 45°

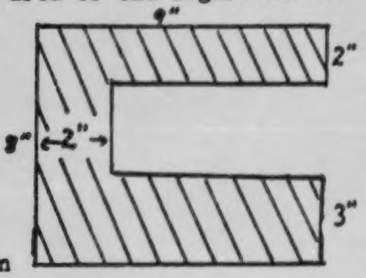


✓ 19. John can do a piece of work in 3 days and Harry can complete the same work in 2 days. If both work together, how long will it take them to complete the work?

A. 6 days
B. 5 days
C. $1\frac{1}{2}$ days
D. $1\frac{1}{5}$ days

GO ON TO THE NEXT PAGE:-

20. What is the area of the figure below?



A. 72 sq.in
B. 54 sq.in
C. 51 sq.in
D. 49 sq.in

21. Which of the following gives the roots of the equation $m^2 + 4m - 45 = 0$?

A. 5, -9

B. -5, 9

C. 5, 9

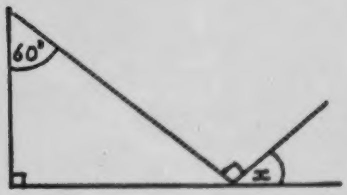
D. -5, -9

22. Solve the pair of equations
$3x - 2y = 7$
and $2x + 5y = -8$
and then find the value of $x + y$.

A. -7
B. -6
C. -1
D. 1

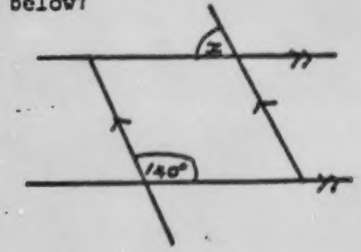
23. Calculate the size of $\angle x$ in the figure below.

A. 30°
B. 45°
C. 50°
D. 60°



24. What is the size of $\angle x$ in the figure below?

A. 30°
B. 40°
C. 60°
D. 80°



25. From the top of a light tower 20 meters high a cargo ship is observed at an angle of depression of 30°. Which of the following gives the distance of the ship from the foot of the light tower? (sine $30^\circ = \frac{1}{2}$, cos. $30^\circ = \frac{\sqrt{3}}{2}$, tan $30^\circ = \frac{1}{\sqrt{3}}$)

A. $20\sqrt{3}$ m

B. $\frac{20}{\sqrt{3}}$ m

C. $\frac{10}{\sqrt{3}}$ m

D. 40 m

26. What is the sum of 5 consecutive even numbers, if x is the smallest?

A. 5x + 10
B. 5x + 15
C. 5x + 20
D. 10x

✓27. Flomo and Momo entered into a business investment with equal sums of money. According to an agreement between them, Flomo is to receive $4\frac{3}{4}\%$ and Momo $4\frac{1}{2}\%$ of the profit. How much does Flomo receive if Momo receives $180.00?

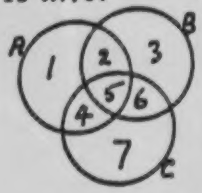
A. $180.00
B. $190.00
C. $200.00
D. $225.00

28. Jarte has $2.25 in dimes and nickles. If he has 3 more nickles than dimes how many nickles has he?

A. 13
B. 14
C. 15
D. 17

29. From the given Venn diagram of sets A,B, and C, what is $A \cap C$?

A. {2,4,5}
B. {4,5,6}
C. {4,5}
D. {5,7}



GO ON TO THE NEXT PAGE:-

30. Six girls have an average age of 16 years 3 months. When another girl is added to the group, the average age becomes 16 years 4 months. How old is the last girl?

A. 16 years 3 months
B. 16 years 4 months
C. 16 years 5 months
D. 16 years 10 months

31. How many centimeters are there in 1.4 meters?

A. 14 cm
B. .14 cm
C. 140 cm
D. 240 cm

32. The number 0.000126 is equal to

A. 0.126×10^{4}.

B. 1.26×10^{-4}.

C. 126×10^{-4}.

D. 1.26×10^{4}.

33. What is the altitude of an equilateral triangle of side 6 inches?

A. 3 inches

B. 3.5 inches

C. $3\sqrt{3}$ inches

D. 4.3 inches

34. Given that $P = \frac{1}{2}Q(3 + Qx)$, express x in terms of P and Q.

A. $x = \frac{(P - \frac{1}{2}Q) - 3}{Q}$

B. $x = \frac{(2P - 3Q)}{Q^2}$

C. $x = \frac{(P - \frac{1}{2}Q)}{3Q}$

D. $x = \frac{(P - \frac{1}{2}Q)}{(3 + Q)}$

35. If a recipe calls for a mixture of 3 pints of vinegar and 5 pints of oil, how much vinegar will be needed to make 12 pints of the mixture?

A. 4.5 pt
B. 5.5 pt
C. 7.5 pt
D. 8.0 pt

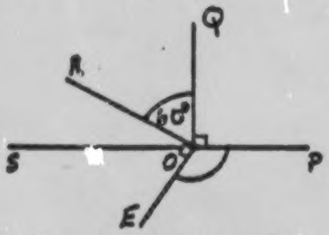
36. In the given figure, SOP is a straight line, QO is perpendicular to SP, RO is perpendicular to EO and $\angle QOR = 60^\circ$. Calculate $\angle EOP$.

A. 90°

B. 110°

C. 120°

D. 180°



37. The sum of the interior angles of a regular polygon is 720°. How many sides had this polygon ?

A. 5
B. 6
C. 8
D. 9

38. A cylindrical kerosine drum has a diameter of 2 feet and a height of 3 feet. Calculate its volume, correct to one decimal place.
(= 3.14)

A. 9.4 cu.ft
B. 9.8 cu.ft
C. 18.8 cu.ft
D. 37.7 cu.ft

39. Twice a certain angle is 12° more than its complement. What is the size of the angle?

A. 26°

B. 34°

C. 64°

D. 56°

GO ON TO THE NEXT PAGE:-

40. If $(6x^2 + 7x - 5) = P(2x-1)$, which of the following is equal to P?

A. $3x + 5$
B. $3x + 3$
C. $3x - 5$
D. $3x - 2$

41. Johnson borrowed $1,200 from a bank at 10% per annum simple interest. How much has he to pay back at the end of $1\frac{1}{2}$ years?

A. $1,212
B. $1,215
C. $1,320
D. $1,380

42. Which of the following points lies on the graph of $2x+y = 10$?

A. (0,8)
B. (3,4)
C. (4,3)
D. (10,0)

43. When a man's salary was increased by $35.00 it became $525.00. What was the increase per cent?

A. $6\frac{1}{4}$%
B. $6\frac{2}{3}$%
C. $7\frac{1}{7}$%
D. 15%

44. Factor completely (a^3-a).

A. $a(a^2-1)$
B. $a(a-1)(a-1)$
C. $a(a+1)(a+1)$
D. $a(a+1)(a-1)$

✓ 45. If one angle of an octagon is 135°, and the rest of the angles are equal to each other, what is the measure of each of the remaining angles?

A. 135°
B. 145°
C. 155°
D. 165°

46. Simplify: $\frac{a^2-2ab}{a^2b} \div \frac{ab-b^2}{ab^2}$

A. $\frac{a-2b}{a-b}$

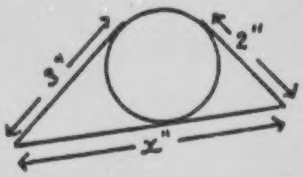
B. $a-2b$

C. $-\frac{1}{a}$

D. $\frac{1-2a}{a}$

47. In the figure, the three lines are tangents to the circle. Calculate the length of x.

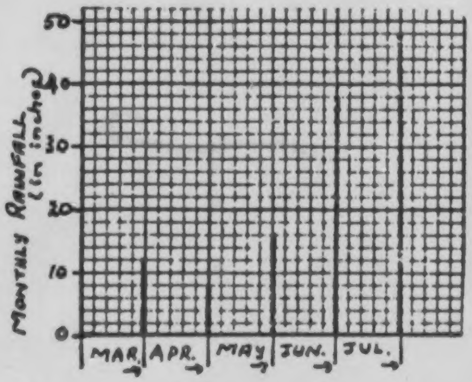
A. 5
B. 6
C. 10
D. 13



48. If $2x - 3 > 7$, then

A. $x = 5$.
B. $x < 5$.
C. $x > 5$.
D. $x = -5$.

Use the graph below for nos. 49 - 50. The graph represents the rainfall for a certain town for the period March - July.



49. What was the height of the rainfall in May?

A. 8 in.
B. 13 in.
C. 16 in.
D. 18 in.

GO ON TO THE NEXT PAGE:-

50. Express the ratio of the lowest to the highest rainfall, in its simplest form.

A. 1 : 50
B. 1 : 6
C. 4 : 24
D. 4 : 25

DO NOT TURN OVER UNTIL YOU ARE TOLD
TO DO SO

SCIENCE - Test Code: 14 **Time Allowed: 1 hour**

Directions: For each question you are given four possible answers labelled A - D. Choose the one that is most correct and blacken the letter of the answer you choose on your answer sheet. Science is Test 14 so you should use the blue printed answer sheet for this test.

1. Dendrites are part of

A. a nerve cell.
B. a gland cell.
C. a muscle cell.
D. an epithelial cell.

2. Glucose and starch are similar in that both are

A. reducing sugars
B. polyscaccharides.
C. carbohydrates.
D. monosaccharides.

✓ 3. An individual that bears two contrasting genes for any trait is

✱ Biology

A. dominant.
[✓ B.] hybrid.
C. pure.
D. recessive.

4. Pollination is the

A. fussion of sperm and ova.
B. release of pollen grains from the filament.
C. transfer of fruit or seed from one place to another.
D. transfer of pollen from the stamen to the stigma.

✓ 5. The flagellum in certain animals and plants is used for

A. digestion.
B. reproduction.
C. excretion.
[✓ D.] locomotion.

✓ 6. Mendel is to heredity as Linneaus is to

✱ Biology

A. biogenesis.
[✓ B.] taxonomy.
C. symbiosis.
D. spontaneous generation.

7. Which of these animals is not a parasite?

A. Hookworm
B. Housefly
C. Plasmodium
D. Liver Fluke

8. When a peeled potato is kept in salt solution which one of the following processes occurs?

A. Osmosis
B. Hydrolysis
C. Plasmolysis
D. Turgidity

9. When homozygous green peas are crossed with homozygous yellow peas, the offspring is

A. homozygous.
B. haploid.
C. mutant.
[✓ D.] heterozygous.

10. Which of the following kind of cells is NOT present in the stem of a palm tree?

A. Xylem vessels
B. Epidermal cell
C. Cambium
D. Pith

11. Which of the following is NOT a typical characteristic of insects?

A. Paired wings
B. Three thoracic segments
C. Six legs
D. Paired spiracles

12. Two analogous organs are

A. gills and lungs.
B. hands and feet.
C. stomach and kidneys.
D. fins and leaves

GO ON TO THE NEXT PAGE:-

13. The excretory organs of the earthworm are
    - A. malpighian tubes.
    - B. gills.
    - C. nephridia.
    - D. spiracles.

14. Life on earth will cease to exist without the sun because the sun is
    - A. at the center of the universe.
    - B. the only source of heat and light.
    - C. a luminous body.
    - D. the primary source of energy.

15. To get rid of chlorophyll from a leaf one should boil the green leaf in
    - A. alcohol.
    - B. iodine.
    - C. tap water.
    - D. vinegar

16. Which of the following is NOT true about seeds? All seeds
    - A. require moisture for germination.
    - B. bring the cotyledon above the soil during germination.
    - C. have some food stored in them.
    - D. have cotyledons.

17. The basic function of the mitochrondria in the cells is to
    - A. produce genes.
    - B. help cell division.
    - C. carry on assimilation.
    - D. control the release of energy.

18. Which of the following carries oxygenated blood from the lungs to the heart?
    - A. Coronary artery
    - B. Hepatic artery
    - C. Pulmonary artery
    - D. Pulmonary vein

19. Homologous organs are similar in
    - A. function only.
    - B. origin and structure.
    - C. origin and function.
    - D. origin only.

20. A perfect flower always has
    - A. only the pistil.
    - B. only the stamen.
    - C. stamen and corolla.
    - D. stamen and pistil.

21. Color blindness is
    - A. a nervous disorder.
    - B. caused by environmental factors.
    - C. a sex linked character.
    - D. caused by hormonal inbalance.

22. Lipase is an enzyme which
    - A. changes peptone to amino acid.
    - B. splits fats and fatty acids into glycerol.
    - C. changes carbohydrates into glucose.
    - D. curdles milk.

23. Adventitious roots
    - A. have slender branches of nearly equal size.
    - B. have large single roots.
    - C. are modified for breathing.
    - D. arise from stem and leaves.

24. An example of a multiple fruit is
    - A. plantain.
    - B. pineapple
    - C. guava.
    - D. lemon.

25. Which of the following is NOT true about amoeba? They
    - A. have two layers of cytoplasm.
    - B. are a mass of living jelly.
    - C. have eyespots.
    - D. move by pseudopodia.

26. The ratio of hydrogen and oxygen combining to form water and hydrogen peroxide illustrates the law of
    - A. definite proportions.
    - B. multiple proportions.
    - C. conservation of matter.
    - D. combining volumes.

GO ON TO THE NEXT PAGE:-

27. The correct formula for calcium nitrate is

A. $2CaNO_3$.
B. $Ca(NO_3)_3$.
C. $2Ca(NO_3)_2$.
[✓ D.] $Ca(NO_3)_2$.

28. The use of soap to wash away grease illustrates the formation of

A. a hydrosol.
B. an aerosol.
C. a gel.
D. an emulsion.

29. Carbon dioxide is identified by its reaction with

A. calcium hydroxide.
B. hydrochloric acid.
C. magnesium.
D. sodium carbonate.

30. What is the valency of sulfate in ammonium sulfate?

A. 4
B. -3
C. 2
D. -2

31. Bleaching powder is effective as a disinfectant because it contains

A. calcium.
B. oxygen.
C. chloride ions.
D. hypochlorite ions.

32. When zinc reacts with dilute sulfuric acid, the salt that is formed

A. dissolves.
B. decomposes.
C. vaporizes.
D. precipitates.

33. Elements with the same atomic number but different atomic mass are

Chem

A. isomers.
[✓ B.] isotopes.
C. isobars.
D. allotropes.

34. The oxidation number of nitrogen in 'laughing gas' is

A. +1
B. +2
C. +3
D. +4

35. When a metallic iron becomes a neutral atom it is said to be

A. oxidized.
B. reduced.
C. sublimed.
D. dissolved.

36. A gas has a volume of 300 cm^3 at 250 mm pressure. What pressure will be needed to reduce the volume to 75 cm^3 temperature being constant?

A. 100 cm^3
B. 1000 cm^3
C. 1200 cm^3
D. 2250 cm^3

37. Epsom salt is used im medicine as

A. an antibiotic
B. anesthetic.
C. a laxative.
D. a sedative.

38. The basic test for Carbon dioxide gas is to test it with

A. hydrochloric acid solution.
B. sulfuric acid solution.
C. lime water.
D. phenolphthalein.

39. When electrons of one atom are transferred to the outer shell of other atoms the bond that results is

A. covalent bonding.
B. electrovalent bonding.
C. coordinate bonding.
D. hydrogen bond.

40. A compound contains 75% carbon and 25% hydrogen. What is its empirical formula? (C = 12, H = 1)

A. C_2H_6
B. CH_3
C. CH_4
D. CH_2

GO ON TO THE NEXT PAGE:-

41. What is the percentage composition of sulfur in $CaSO_4$? [Ca=40, C=12, S=32, O=16]

[✓ A.] 23.5
B. 34.0
C. 36.0
D. 64.6

42. The chemical name of NH_4NO_2 is

A. ammonium nitrite.
B. ammonia.
C. ammonium nitrate.
D. nitrous ammonia.

43. What gas is evolved when hydrochloric acid reacts with iron?

A. Chlorine
B. Nitrogen
C. Hydrogen
D. Oxygen

44. Chlorine can be prepared in the laboratory by the action of hydrochloric acid on HCl +

A. $NaCl$.
B. MnO_2.
C. H_2O_2.
D. Na_2SO_4.

45. Nitrates are widely used as

A. antiseptic.
B. bleaching agent.
C. fertilizer.
D. refrigerant.

46. For two objects to be in resonance, they must have the same

A. length.
B. mass.
C. frequency.
D. velocity.

47. The rate of motion in a particular direction is referred to as

A. beam.
B. shade.
C. acceleration.
D. displacement.

48. Rays parallel to the principal axis of a convex mirror appear to

A. pass undeflected.
B. converge toward the principal focus.
C. diverge from the principal focus.
D. be absorbed.

49. Heat reaches the earth by a process called

A. conduction.
B. convection.
[✓ C.] radiation.
D. reduction.

50. If a body is dropped from the pinacle of a church, what distance will it fall in half a second?

A. 32 ft.
B. 8 ft.
C. 16 ft.
D. 4 ft.

51. Convex mirrors are preferred to plane mirrors as driving mirrors because convex mirrors

A. give magnified images.
B. are more durable.
C. give a wider field of view.
D. produce brighter images.

52. Which of the following is NOT a common property of a wave?

A. Rectilinear propagation
B. Amplitude
C. Reflection
D. Refraction

53. A boy 5.0 feet tall stands 20 inches from a small pinhole camera. If the camera is 6.0 inches deep, the boy's image is approximately

A. 24 inches.
B. 16 inches.
C. 8.5 inches.
D. 1.5 inches.

54. The real image is always

A. larger than the object.
B. smaller than the object.
C. inverted.
D. reverted.

GO ON TO THE NEXT PAGE:-

55. What mass of water is contained in a tin can 8 cm by 4.5 cm by 3.5 cm?

A. 126 cm^3
B. 126 gm
C. 1000 lb.
D. 1024 lb.

56. Which one of the following statements is NOT true about sound?

A. Sound waves are longitudinal.
B. Musical notes have definite pitches.
C. The range of audible frequency of man changes with age.
D. Sounds of all frequencies travel with the same velocity.

57. Three lamps of 20 ohms, 30 ohms and 60 ohms are connected in 63 parallel to a 120 volt line. What is the total current in the lamps?

A. 2 ampere
B. 4 ampere
C. 6 ampere
D. 12 ampere

58. Which of these does not involve elasticity?

A. Inflating a balloon.
B. Puncture of a tyre.
C. Drinking with a straw.
D. Weighing with a spring scale.

59. A piece of glass weighs 30.2 gm in air, 18.2 gm in water and 20.6 gm in alcohol. What is the specific gravity of alcohol?

A. 1.2
B. 1.0
C. 0.8
D. 0.6.

60. Which of the following is an example of an internal combustion engine?

A. Automobile engine
B. Reciprocating engine
C. Gas turbine
D. Steam engine

61. Which of the following lenses is used in a magnifier?

A. Convex
B. Concave
C. Cylindrical
D. Piano-concave

62. Lightning during thunderstorms is the result of

A. heat released in the cloud.
B. a sudden electrical discharge from the clouds.
C. the release of solar energy.
D. radiation of electricity through the sky.

63. Which one of the following is NOT true of a curved mirror? It has

A. a center of curvature.
B. a screen.
C. a principal axis.
D. an aperture.

64. Which of the following is NOT a mechanical action?

A. Friction
B. Percussion
C. Combustion
D. Compression

65. The blotting paper uses the principle of the phenomenon of

A. surface tension.
B. osmosis.
C. diffusion.
D. effusion.

THIS IS THE END OF THE EXAMINATION.

LNE/SH. 1978

Booklet No. ________

WEST AFRICAN EXAMINATIONS COUNCIL
LIBERIAN NATIONAL EXAMINATION
SENIOR HIGH SCHOOL

LANGUAGE ARTS & SOCIAL STUDIES

GENERAL INSTRUCTIONS

1. THERE ARE TWO TESTS IN THIS BOOKLET. YOU MUST ANSWER ALL THE QUESTIONS IN EACH TEST.

2. THERE IS A SET TIME FOR EACH TEST. YOU MAY ONLY WORK ON THE QUESTIONS OF A PARTICULAR TEST DURING THE TIME ALLOWED FOR THAT TEST. IF YOU FINISH A TEST BEFORE TIME IS UP, CHECK YOUR ANSWERS CAREFULLY. YOU ARE NOT ALLOWED TO START THE NEXT TEST UNTIL YOU ARE TOLD TO DO SO.

3. YOUR ANSWERS MUST BE MARKED IN PENCIL ON THE SEPARATE ANSWER SHEET PROVIDED.

4. FOR EACH ANSWER YOU MARK, MAKE SURE THAT THE NUMBER ON THE ANSWER SHEET AGREES WITH THE QUESTION YOU WISH TO MARK.

5. THERE ARE SEPARATE INSTRUCTIONS AT THE BEGINNING OF EACH TEST. READ THEM CAREFULLY BEFORE ANSWERING THE QUESTIONS.

6. DO ALL YOUR ROUGH WORK IN THE BOOKLET.

C 1978 West African Examinations Council

LANGUAGE ARTS - TEST CODE: 11 **Time Allowed: 2 hours**

You will have 2 hours to work on Language Arts which is divided into seven sections. You are to read the directions for each section carefully and then answer the questions.

Section 1

Directions: In this section, there are five (5) passages, each of which is followed by some questions based on the content of the passage.

Read each passage and the questions carefully, and select the best answer to each question. Then blacken the corresponding space on the answer sheet.

Answer all questions using only information given in the passages. Record your answer on the answer sheet by shading the answer space which bears the same letter as the answer you have chosen.

You are advised NOT to spend more than 50 minutes on this section.

PASSAGE A

It is high time African leaders stopped playing games of individualism when by doing so they will be exploited by the neo-colonialists. It is my view that no European will give back an inch of territory in Southern Africa as long as Africa is divided, and as long as Africa is weak militarily and economically. The only solution to the liberation problem seems to be to continue to fight while at the same time being willing to negotiate from a vantage point.

If we must fight while we negotiate, African countries must keep their commitment to the Liberation Movements. If we are to walk side by side with our brothers in Southern Africa while they fight and negotiate, we must pay our contributions to those Liberation Movements. We must urge our governments to set aside one percent (1%) of our national budget for the Liberation of Africa. My cardinal assumption is that neither fighting nor negotiating should be substituted for one another. These are tools which must be employed against the evils of apartheid in Southern Africa, and against minority rule in Zimbabwe and all other forms of discrimination, in any part of Africa, including those of Namibia. Africa will never really be free until every inch of territory on this great continent shall have sung the song of freedom, and shall have taken control of its economic destiny.

1. The main idea in the passage is
   - A. the total Liberation of Africa.
   - B. financial support of Liberation Movements.
   - C. the role of Liberation Movements.
   - D. evils of apartheid in Southern Africa.

2. No European will give back any territory as long as
   - A. there are Liberation Movements.
   - B. Africans control their own economy.
   - C. the continent of Africa is not united.
   - D. the evils of apartheid exist in Southern Africa.

GO ON TO THE NEXT PAGE

3. The author favors
   - A. negotiating rather than fighting.
   - B. fighting rather than negotiating.
   - C. negotiating and fighting together.
   - D. neither negotiating nor fighting.

4. To support Liberation Movements financially, the author suggests that
   - A. governments must tax their citizens.
   - B. governments must provide 1% of the Liberation budget.
   - C. each government must give 1% of its budget to the neo-colonialists.
   - D. each government must give 1% of its budget to the Liberation Movements.

5. Negotiate in the passage means to
   - A. take something by force.
   - B. prolong an important discussion.
   - C. ignore an important discussion.
   - D. discuss so as to reach agreement.

PASSAGE B

A marvelous display of the kind of patience needed by a true scientist was exhibited over a period of some fifteen years by an ichtyclogist named James L.B. Smith. This ichtyclogist (a scientist who studies fish) heard that a remarkable fish had been caught by a fisherman off the South African Coast. From the description of the fish, Smith gathered that it was a coelenterate. But if he were right in his assumption, this would prove to be more than a mere incident in the annals of ichthyology, for the coelenterate had supposedly been extinct for some seventy-five million years.

In expectant excitement, James Smith set out to find the fisherman and his singular catch, but the meeting was more disappointing than joyous. The fish bore all evidence of being truly a coelenterate, but it had taken Smith so long to arrive that by now most of the specimen had rotted away. The skeleton of the fish and the hefty armor which passed for scales served to deepen Smith's sense of having been thwarted by time in his desire to view this marine wonder. He made up his mind that some day he would view a coelenterate whole and intact.

For fifteen years Smith held to his purpose. Up and down the coast of South-east Africa he distributed pamphlets offering a large cash reward for a fresh specimen. His perseverance was rewarded when in January, 1953, the master of a small sailing vessel cabled the news to Smith that another coelenterate had been caught near Madagascar.

A long-held dream was fulfilled when James Smith stood for the first time triumphantly examining the newly caught coelenterate, only slightly damaged because of having been clubbed to death by the fisherman. Five feet long, iridescent blue in color, the monster had blue eyes, a peculiar club-like tail and bulbous fins.

6. James Smith appears to be a man who is NOT
   - A. unusual.
   - B. clever.
   - C. easily excited
   - D. easily discouraged.

GO ON TO THE NEXT PAGE

7. The coelenterate's scales are probably used for

   A. decoration.
   B. protection.
   C. catching food.
   D. swimming.

8. Smith advertised for a coelenterate by the use of

   A. leaflets.
   B. native messengers.
   C. newspaper.
   D. radio.

9. The fact that the fish was clubbed suggests that the fish was

   A. thought to be remarkable.
   B. hard to kill.
   C. very hard to be caught.
   D. caught in shallow water.

10. In this story, the word gathered means

   A. collected.
   B. concluded.
   C. saved.
   D. crowded.

11. The best name for this story is

   A. Patience Rewarded.
   B. The Great Blue Fish.
   C. A Patient Fisherman.
   D. A Prehistoric Monster.

12. The author of this story is trying to be

   A. scientific.
   B. imaginative.
   C. amusing.
   D. informative.

13. In this story, the word singular means

   A. hefty.
   B. one.
   C. separate.
   D. unusual.

PASSAGE C

Gold is a peculiar stuff, a happy marriage between matter and idea. As the ultimate measure of values, this wonderful metal clatters round the globe in an unceasing stream of smoothly finished yellow bars.

As the one time base of our money, and still a pillar of today's international monetary system, gold to most of us becomes almost an abstraction. But gold is also something else — the king of metal and a friend of man. Without it our civilization would not be the same. Its scientific symbol indicative of man's long affair with gold for centuries, was a picture of the sun.

GO ON TO THE NEXT PAGE

Impervious to the ravages of time, not tarnished by air, water and most corrosives, gold bears the imprint of eternity. Gold has been melted down, recast and melted down so long that the ring you buy today may contain gold that once shone in the necklace of the Queen of Sheba. Gold performs in many guises from pen-points to the gold plated "umbilical cord" of space-walking astronauts.

Bright, lustrous and astonishingly heavy, gold is more malleable and ductile than any other metal. Alloyed with other metals to acquire hardness, gold changes its complexion: silver will make it pale, while copper makes it bluish; such fancy shades as green, orange, ruby and purple can thus be obtained.

Today, although no nation uses gold as legal tender, some still mint gold to satisfy the huge demand. People now buy gold coins legally at any bank and they consider them the best insurance against all calamities.

Geologists assure us that, while there is plenty of gold left in the present mines now worked, major new gold strikes are unlikely in the future. But whether gold production falls or rises, demand for gold will ever outrun supply. Man will continue to be fascinated with the yellow metal, as he has been for some 6,000 years.

14. In the passage, the writer's statement that "gold is a marriage between matter and idea" may mean that

    A. gold is a mineral shaped by man's mind.
    B. gold can be obtained after marriage.
    C. gold has some idea in it.
    D. a married couple usually get gold as a gift.

15. The phrase "as the one time base of our money" may mean that

    A. gold has weight.
    B. gold was not popular.
    C. gold was the standard of value.
    D. gold was of a base metal used for money.

16. Why does the writer think that gold bears the imprint of eternity? Because

    A. it is yellow in colour.
    B. it does not change or wear out with time.
    C. it is stored in vaults in banks.
    D. it usually decreases in weight with time.

17. The ring you buy may contain gold that was once used by the Queen of Sheba because

    A. it was the Queen of Sheba who discovered gold.
    B. all gold was owned by the Queen of Sheba.
    C. gold has been melted and remoulded for many years.
    D. the bright colour is like that worn by the Queen of Sheba.

18. According to the passage gold is mixed with other metals to make it

    A. soft.
    B. hard.
    C. heavy.
    D. smooth.

GO ON TO THE NEXT PAGE

19. The statement "gold as legal tender" may mean that

A. it can be used for payment.
B. it cannot be used to purchase property.
C. it is used mainly for legal purposes.
D. lawyers get a lot of gold.

20. Gold may change its complexion

A. because of constant usage.
B. due to prolonged storage.
C. when it is alloyed with other metals.
D. when it is polished with a soft cloth.

PASSAGE D

In 1964 the Surgeon General of the United States issued a report on medical research concerning smoking. He warned the public that cigarettes are a serious danger to life and health. Nevertheless, millions of Americans still find cigarettes irresistible, and per capita consumption is going up. The report cited cigarette-smoking as the major cause of lung cancer and chronic bronchitis. Smoking is also an important cause of the cancer of the larynx and is associated with an increased risk of the cancer of the bladder and of the esophagus. It contributes to heart disease, peptic ulcer, cirrhosis of the liver and the smallness of babies at birth.

In the decade since 1964, additional health hazards have been cited.

The anti-smoking movement has brought about the following changes: restrictions of smoking in planes and trains; segregated areas for non-smokers in a growing number of restaurants; segregation of smokers in the military quarters; and legislation either passed or being considered in many cities and states as well as in Congress for prohibition of smoking in public areas.

21. Smoking can cause cancer

A. of the lungs and larynx.
B. of the liver.
C. of the heart.
D. in small babies.

22. The article says non-smokers are now being protected by

A. a law prohibiting smoking in all the states.
B. the isolation of smokers in some areas.
C. a law of Congress.
D. a frequent medical examination.

23. The article shows that

A. the Surgeon General's report was well received by many smokers.
B. the Surgeon General's report caused alarm amongst many smokers.
C. the anti-smoking movement prohibits smoking in planes.
D. the anti-smoking movement is helping non-smokers.

24. The word irresistible as used in this article means

A. very tempting.
B. too expensive.
C. extremely fragrant.
D. not healthy.

GO ON TO THE NEXT PAGE

PASSAGE E

Such homely virtues as thrift, hard work, and simplicity appear old-fashioned in these days. So probably we want to remember the career of Benjamin Franklin, a true American. Though he had slight formal education, he became one of the best educated men of his days, for he discovered the simple principle that one learns only what he teaches himself. Most teachers can direct and organize the search for skills and information, but few can inspire. There is no substitute for the drudgery of learning. Franklin learned a trade and began reading inspirational books. He sought self-reliance and expressed thoughts that have interested more than one generation of readers. His essays and his autobiography reveal that his knowledge was useful.

25. This passage suggests that
    - A. old fashioned virtues should be discarded.
    - B. most people have the homely virtues.
    - C. learning needs not be drudgery.
    - D. anyone who applies himself can get an education.

26. Drudgery in this passage means
    - A. fatigue.
    - B. reward.
    - C. incentive.
    - D. un-pleasantness.

7. According to the passage, Benjamin Franklin
    - A. did not want to be educated in a school.
    - B. was too clever for his teacher.
    - C. did not have much formal education.
    - D. believed that schools did not require teachers.

. Which of the following did NOT contribute to Benjamin Franklin's education?
    - A. Learning a trade
    - B. Reading of inspirational books
    - C. Discovery of the simple principle of self-teaching
    - D. The thrift of his parents

29. The passage says that not many teachers can
    - A. work hard enough.
    - B. teach skills to their pupils.
    - C. inspire their students.
    - D. provide useful information.

30. Which of the following qualities is NOT attributed to Benjamin Franklin in the passage?
    - A. Thrift and hard-work.
    - B. Simplicity.
    - C. Self-reliance.
    - D. Integrity.

GO ON TO THE NEXT PAGE

31. According to the passage, the writer

A. prefers the values of the past to those of the present.
B. is angry with the present generation of students.
C. believes that it is old fashioned to be thrifty and hard-working.
D. thinks only homely people should be thrifty and simple.

Section II

Directions: Read the following questions 32 - 46, carefully and decide on the correct answers. Record your answer in the usual way.

32. The central theme of the play 'Macbeth' is

A. enmity between England and Scotland.
B. border warfare.
C. the downfall of an ambitious character.
D. the foolishness of women.

33. 'Sunset and evening star and one clear call for me' is a quotation from

A. Tennyson's "Crossing the Bar".
B. Wordsworth's "The Solitary Reaper".
C. Shakespeare's "As you like it".
D. Shelly's "Ode to the West Wind".

34. 'Paradise Lost' describes

A. the fall of man.
B. a pilgrimage.
C. the resurrection of the dead.
D. the end of the world.

35. Jonathan Swift was best known as a

A. great poet.
B. famous novelist.
C. playwright.
D. fierce satirist.

36. "The evil that men do lives after them; the good is oft interred with their bones" is a quotation from

A. Elegy in a Country Churchyard.
B. Julius Caesar.
C. Hyperion.
D. Dr. Faustus.

37. The 19th century American writer who wrote the essay, "Civil Disobedience" was

A. William Bryant.
B. Philip Freeman.
C. Ralph Wald Emerson.
D. David Thoreau.

GO ON TO THE NEXT PAGE

38. An elegy is a lyric which

    A. expresses hope.
    B. commemorates heroism.
    C. expresses grief.
    D. describes humor in nature.

39. 'Sila Marner' is the story of

    A. a prince in disguise.
    B. a poor weaver.
    C. a soldier.
    D. a prominent statesman.

40. Edgar Allen Poe's poetry is noted for its

    A. mystery and beauty.
    B. lack of rhyme.
    C. lack of rhythm.
    D. depth of thought.

41. 'The Assyrians came down like a wolf on the fold' is an example of

    A. hyperbole.
    B. metaphor.
    C. personification.
    D. simile.

42. A poem that describes the natural life in a rustic setting is

    A. an elegy.
    B. a pastorial.
    C. a satire.
    D. a ballad.

43. "The world will little note nor long remember what we say here", is an extract from

    A. Washington's farewell address.
    B. The Declaration of Independence.
    C. Lincoln's Gettysburg Speech.
    D. Lincoln's second inaugural address.

44. Anthony's statement in 'Julius Caesar' that Brutus is an honourable man is an example of

    A. hyperbole.
    B. sarcasm.
    C. satire.
    D. irony.

45. 'Oh, east is east and west is west, and never the twain shall meet', is a quotation from

    A. Rudyard Kipling.
    B. Thomas Hardy.
    C. Joseph Conrad.
    D. Alfred E. Hensman.

GO ON TO THE NEXT PAGE

46. "But we loved with a love that was more than love, I and my Annabel Lee" is taken from a poem by

A. Tennyson.
B. Poe.
C. Shelley.
D. Longfellow.

Section III

Directions: In each of questions 47 - 51, you are given four words labelled A - D. Three of the words are spelled correctly, and only one is mis-spelled. On your answer sheet, for each question, blacken the space bearing the same letter as the mis-spelled word.

47. A. suspicious
B. courageous
C. spacious
D. vegorous

48. A. physiology
B. biology
C. etomology
D. geology

49. A. volcanic
B. atehletic
C. dramatic
D. apologetic

50. A. penitence
B. innocence
C. elegence
D. indolence

51. A. deformity
B. dexterity
C. scarceity
D. animosity

Section IV

Directions: In each of questions 52 - 91, you are given a sentence which contains a blank space. Under each sentence there are four words or expressions labelled A - D. Choose from the words or expressions the one which best fills the space in the sentence and record your answer in the usual way.

52. If he had gained five more votes, he ..... the election.

A. had won
B. would win
C. will have won
D. would have won

GO ON TO THE NEXT PAGE

53. He had no idea how long ......

A. has he been asleep
B. had he been asleep
C. he had been asleep
D. he has been asleep

54. The high cost of living has stopped traders ..... goods on credit.

A. from selling
B. to sell
C. to have sold
D. in selling

55. We changed ..... because he preferred mine and I preferred his.

A. hat
B. hats
C. each other's hat
D. each other's hats

56. As she looked at her little child dying, she found it impossible to control her ......

A. emotions
B. morals
C. instincts
D. sentiments

57. She allowed several days to ..... before she sent in her resignation.

A. diverge
B. evolve
C. elapse
D. emerge

58. I would be pleased if he ......

A. will come
B. has come
C. comes
D. came

59. The thief never admitted ..... the money.

A. to steal
B. have stolen
C. stealing
D. to have stolen

60. That was the...... story I have heard.

A. more interested
B. most interesting
C. interested
D. more interesting

GO ON TO THE NEXT PAGE

61. There was so much food ..... he couldn't finish it.

A. until
B. which
C. that
D. so

62. They don't have ..... time to waste.

A. so much of
B. more of
C. some
D. a lot of

63. If anyone greets you, it is only polite to return .....

A. his
B. their
C. one's
D. anyone's

64. Alice gave up her house by the noisy market and went to live in a more ..... place.

A. secluded
B. reserved
C. seceded
D. secretive

65. It wasn't he who took my book, it must have been ......

A. somebody
B. another
C. somebody else
D. anybody else

66. Mary will not return to school ..... her father pays her tuition.

A. despite
B. unless
C. notwithstanding
D. nevertheless

67. The teacher made a lot of errors ..... he apologized to the students.

A. which
B. that
C. so that
D. for which

68. We would like to say ....

A. certainty with a few things
B. a certainty with few things
C. things with a few certainty
D. a few things with certainty

69. I don't normally agree with him, but this statement is true .....

A. at a great extent
B. to a great extent
C. in a great extent
D. for a great extent

GO ON TO THE NEXT PAGE

70. He asked for a box of .....

A. four-inch nails
B. four-inches nail
C. four-inch nail
D. four-inches nails

71. They were determined to build their church where the Pagan Shrine originally .....

A. stands
B. stood
C. has been
D. has stood

72. If Mr. Toe had known your address, he ..... to you.

A. will write
B. would have written
C. will be writing
D. would write

73. If only I ..... one hundred dollars yesterday, I would have bought a good used car.

A. had had
B. have had
C. would have had
D. was having

74. "Have you seen Bah this morning? "Yes, I saw him ..... this way a few minutes ago".

A. pass
B. passed
C. to be passing
D. to have passed

75. When the child hurt herself, she ..... her mother for sympathy.

A. looked up
B. expected
C. appealed
D. turned to

76. We were all pleased that the drama turned ..... to be such a great success.

A. in
B. out
C. up
D. on

77. Joyce did not want to be a nurse, but her mother was very .....

A. forceful
B. insistent
C. constant
D. consistent

GO ON TO THE NEXT PAGE

78. Comfort remained cheerful during her illness and never ..... despair.

A. gave up for
B. put up with
C. adhered to
D. gave in to

79. John is the only one of the boys who ..... the news about the new salary scale.

A. haven't heard
B. having heard
C. hasn't heard
D. have heard

80. The students asked their teacher .....

A. if they could go to the dormitory early
B. whether could they go to the dormitory early
C. could they go to the dormitory early
D. they could go to the dormitory early

81. The gift of one million dollars to the Liberation Movement was certainly an act of .....

A. ingenuity
B. generosity
C. hospitality
D. clemency

82. The volunteers said that they were ..... ready to help.

A. quite
B. so
C. rather
D. much

83. The teacher exclaimed, "I have never heard ..... story in all my life".

A. a more ridiculous
B. the more ridiculous
C. more ridiculous
D. a most ridiculous

84. The monitor has never been nice to me, ..., he was very rude to the supervisor.

A. yet
B. moreover
C. although
D. nevertheless

85. Alice thinks that both ..... will fail the entrance examination.

A. she and me
B. her and I
C. she and I
D. I and her

GO ON TO THE NEXT PAGE

86. There may be some difficulties ..... the two ideas.

A. to be reconciling
B. in reconciling
C. of reconciling
D. for the reconciling

87. The secretary of the committee thanked the editor for giving them .....

A. the informations
B. an information
C. the information
D. some informations

88. The secretary's car did not start; ....., she was late for work.

A. where-upon
B. despite this
C. consequently
D. nevertheless

89. The defeated teams left the field looking extremely .....

A. decomposed
B. dejected
C. dismantled
D. distorted

90. Our leading teams were not only defeated, but ..... by their opponents.

A. violated
B. humiliated
C. dissolved
D. controlled

91. The fragrance of the lily has ..... the entire house.

A. permeated
B. initiated
C. saturated
D. infiltrated

Section V

Directions: In questions 92 - 101, you are given a sentence containing a word or words which are underlined. Under each sentence there are four words or phrases labelled A - D. Choose the word or phrase which is nearest in meaning to the underlined word or words, and then shade the answer space which bears the same letter as the answer you have chosen. Record your answer in the usual way.

92. His father was hard working but rather clumsy.

A. impatient
B. impenitent
C. awkward
D. untruthful

GO ON TO THE NEXT PAGE

93. My frequent advice failed to induce any change in his behavior.

A. alter
B. cause
C. force
D. inflate

94. Dragons are believed to emit flames of fire on their opponents.

A. exchange
B. inflict
C. send forth
D. burn out

95. The obstinate child refused to leave the room.

A. persistent
B. stubborn
C. dutiful
D. tired

96. Musu's beauty enchanted her professor.

A. captivated
B. interested
C. surprised
D. worried

97. The results of his efforts proved his efficiency.

A. readiness
B. competence
C. initiative
D. enthusiasm

98. How could he tell? I think he must be omniscent.

A. all-powerful
B. all-seeing
C. all-knowing
D. all-present

99. His comment on the novel was a subjective judgment.

A. reasoned
B. personal
C. casual
D. detached

100. He was a sturdy character, but he also possessed a certain measure of flexibility.

A. weakness
B. capability
C. persuasive
D. authoritative

101. His remarks on the subject were not pertinent.

A. admissible
B. relevant
C. persuasive
D. authoritative

GO ON TO THE NEXT PAGE

Section VI

Directions: In questions 102 - 106, you are given a set of sentences. Each sentence is followed by four possible interpretations labelled A - D. Choose the best interpretation for each sentence, and record your answer in the usual way.

102. My uncle Tamba has a very good head for business.
This means that uncle Tamba

A. is the chief executive of his business.
B. would make a successful business man.
C. has advanced very quickly in his job.
D. is the best Mathematician in his firm.

103. On the strength of the report, they decided to wait another hour.
This means that they waited another hour

A. in order to be able to present a better report.
B. because they had definite instructions to that effect.
C. because what they heard made it advisable for them to wait.
D. they hadn't yet got the expected instructions for them to proceed.

104. The manager said that he was by no means unsympathetic to the workers' demands, but that he was quite unable to grant them.

From this we know that the manager thought that the workers demands were

A. reasonable.
B. outrageous.
C. insulting.
D. saddening.

105. If he were to offer me the job, I would never accept it.

From the sentence, it is clear that

A. he has not offered me the job.
B. he has offered me the job already.
C. he is being forced to offer me the job.
D. he would like to offer me the job.

106. Leaders who regularly take unpopular decisions are often thick-skinned.
This means that such leaders

A. often take decisions quickly without careful thought.
B. cannot easily be wounded if attached.
C. are not affected by the criticisms of others.
D. do not know in what ways their decisions affect others.

Section VII

Directions: In questions 107 to 110, you are given a sentence with four possible positions for a comma, marked 1, 2, 3, 4,. Decide in which of these positions a comma is necessary and then choose which of the options labelled A, B, C, D gives the position or positions you have chosen. Record your answer in the usual way.

107. Before you paint$_1$ the surface$_2$ of course$_3$ should be free of rust$_4$ and dirt.

A. 1 only
B. 2 only
C. 1, 2, and 3
D. 1, 2, 3, and 4

108. Caffeine$_1$ which is present in both tea$_2$ and coffee$_3$ stimulates the heart$_4$ and raises the blood pressure.

A. 1 and 4 only
B. 1 and 3 only
C. 3 and 4 only
D. 1, 2, 3, and 4

109. Touring with Towser'$_1$ a directory published by a dog food company$_2$ lists hotels$_3$ and motels$_4$ which welcome people with dogs.

A. 1 and 4
B. 2 and 3
C. 1, 3, and 4
D. 1, 2, and 4

110. In many countries$_1$ of the world$_2$ only the rich$_3$ can afford cars$_4$ and appliances.

A. 1 only
B. 2 only
C. 1, 2, and 3
D. 2, 3, and 4

STOP: DO NOT TURN THIS PAGE OVER UNTIL YOU ARE TOLD TO DO SO.

SOCIAL STUDIES - Test Code: 12 Time Allowed: 45 Minutes

Directions: In each of the following items, one of the four answers is correct. Read each item carefully and select the correct answer. Shade on your answer sheet, the answer space which bears the same letter.

Use the top part of the answer sheet for this test.

1. Which country in West Africa has the highest annual rainfall?
   - A. Liberia
   - B. Ghana
   - C. Ivory Coast
   - D. Sierra Leone

2. The time at Longitude 30° W is 5.00 p.m. Calculate the time at Longitude 150° W.
   - A. 7.00 a.m.
   - B. 7.00 p.m.
   - C. 9.00 a.m.
   - D. 9.00 p.m.

3. The West European type of climate is experienced in
   - A. British Columbia.
   - B. Mainland China.
   - C. Algeria.
   - D. Quebec.

4. Neap tide occurs when the
   - A. solar and lunar tides are formed in the same direction.
   - B. solar and lunar tides are formed in the opposite direction.
   - C. earth, moon and sun are in the same straight line.
   - D. moon is between the sun and earth on the same plane.

5. Which of these is NOT a characteristic feature of wet plains?
   - A. They contained high percentage of cultivated land.
   - B. The surface facilitates transportation.
   - C. They contain sparse and spotty population.
   - D. The surface facilitates the growth of trading centers.

6. Which of the following factors least influences population density in the world?
   - A. Climate
   - B. Relief
   - C. Rock structure
   - D. Water supply

7. Which of the following places experiences mid-night sun in June?
   - A. Japan
   - B. Norway
   - C. Cuba
   - D. Antarctica

8. A mountain formed by the accummulation of molten materials from the interior of the earth is called a
   - A. table mountain.
   - B. residual mountain.
   - C. volcanic mountain.
   - D. fold mountain.

9. Which one of the following mountains is NOT found in the eastern part of Africa?
   - A. Kilimanjaro
   - B. Elgon
   - C. Ruwenzori
   - D. Atlas

10. Rain is produced when
    - A. cool moisture laden air gets warm.
    - B. warm moisture laden air gets cold.
    - C. lightning strikes the clouds.
    - D. warm dry and cold moisture laden air meet.

11. Which of the following statements about lines of latitude is FALSE?
    - A. They are parallel to the equator
    - B. They are the same distance apart all around the earth
    - C. They run together at the North and South Poles
    - D. They cross the prime meridian

TURN OVER TO THE NEXT PAGE:-

12. Which of the following African countries is a principal groundnut producing country?

A. The Gambia
B. Mali
C. Nigeria
D. Sudan

13. Which of the following rivers flows into the Indian Ocean?

A. River Nile
B. River Congo
C. River Zambezi
D. The Orange River

14. A map which shows the elevation of the land is called a _______ map.

A. political
B. vegetation
C. relief
D. geological

15. A river which flows into another river is called a

A. cape.
B. bay.
C. canal.
D. tributary.

16. If you were travelling Southward from Liberia alone at seacoast of Africa, which ports would you arrive at first?

A. Port Harcourt
B. Libreville
C. Tema
D. Luanda

17. Which of the following countries is NOT an exporter of rubber?

A. Malaya
B. Indonesia
C. Argentina
D. Liberia

18. Ships sailing from the Atlantic Ocean enter the Mediterranean Sea by way of the

A. Straight of Magellan.
B. Straight of Gibraltar.
C. Suez Canal.
D. English Channel.

19. An important contribution of ancient Greece was the

A. introduction of Algebra.
B. development of philosophy.
C. invention of the alphabet.
D. abolition of slavery.

20. Which of the following was an important factor in the development of civilization in ancient Egypt?

A. Dictatorship of the Pharoahs.
B. Conquest of Alexander the great.
C. Location of the Nile River.
D. The influence of the Persians.

21. In which area of the world did the leading religions of today originate?

A. Asia
B. North Africa
C. North America
D. Western Europe

22. The events described in the New Testament took place during

A. the Golden Age of Greece.
B. the era of the construction of the Pyramids.
C. the early years of the Roman Empire.
D. the Middle Ages.

23. The Greeks and Romans civilization differed from the earlier civilization of Egypt because

A. the Greeks used stones to build their houses.

B. the Greeks had some voices in their government.

C. the Greek Kings had more power.

D. the Greeks had fewer god.

24. Which of the following languages was most generally used in Western Europe during the Middle Ages?

A. Italian
B. French
C. Greek
D. Latin

TURN OVER TO THE NEXT PAGE:-

A person famous as an artist, a scientist, and a craftman was

A. Nicolas Copernicus.
B. Leonardo da Vinci.
C. Isaac Newton.
D. John Calvin.

After the Napoleonic wars, the rulers of Europe united to

A. promote the growth of democracy.

B. protect the people from unjust attack.

C. protect Western Europe from autocratic Russia.

D. oppose liberal ideas.

The fundamental causes of the French Revolution were

A. social and economic abuses.

B. attacks on France by her neighbors.

C. communist agitations.

D. attempts of the nobility to limit the kings power.

An important reason for the interest of the Western powers in China during the 19th century was that China

A. had a large supply of oil.

B. was a good market for farm machinery.

C. served as an outlet for Europe's surplus population.

D. offered opportunities for profitable trade.

9. Great Britain secured power over the Suez Canal by

A. acquiring it through negotiation.

B. seizing it from Egypt.

C. buying the controlling shares of stock.

D. capturing it in World War I

30. The Western European Union can BEST be described as

A. a specialized agency of the United Nations.

B. an international labor organization.

C. a communication corporation.

D. a plan for military cooperation.

31. The best safeguard against the H-Bomb is

A. evacuation of large cities.

B. international inspection and control.

C. expansion of the radar network.

D. more civilian defence drill.

32. The special agencies of the United Nations raise their funds mainly by

A. selling stamps, tracts and cards.

B. charging for their services.

C. collecting tax on exports.

D. receiving contributions from member nations.

33. The non-permanent members of the Security Council are elected by

A. the international court of Justice.

B. the permanent members.

C. the representatives of the secretariat.

D. the General Assembly.

34. Which of the following agencies of the United Nations seeks to promote cultural cooperation and better understanding among nations?

A. UNICEF
B. Security Council
C. Trusteeship Council
D. UNESCO

35. "Too much money chasing too few goods", This economic situation is called

A. recession.
B. depression.
C. inflation.
D. boom.

TURN OVER TO THE NEXT PAGE:-

36. A nation which gives support to neither side in a controversy is said to be

A. a neutral nation.
B. a belligerent nation.
C. a puppet state.
D. an allied nation.

37. Which group correctly pairs a nation with a leading person in the development of its nationalism?

A. France - Prince Henry the Navigator
B. Nigeria - Nkrumah
C. Italy - Cavour
D. Spain - Charlemagne

38. Nationalism may best be defined as

A. the desire to rule over other people.
B. the awaking of people's interest in their country.
C. the respect for law and order.
D. the willingness to use force to gain ends.

39. British control of South Africa was actively promoted by

A. Robert Clive.
B. William Wilberforce.
C. David Livingstone.
D. Cecil Rhodes.

40. In ancient Egypt "Shadoof" was used as

A. a tomb for ordinary people.
B. a means of irregation.
C. a pen.
D. a measure of the height of pyramids.

41. The famous Emperor of Melle (Mali) who made a pilgrimage to Mecca and carried much gold with him was

A. Mansa Musa.
B. Ashia Mohamed I.
C. Sundiata.
D. Sakum.

42. Which of the following Empires came after the ancient Ghana Empire?

A. Ashanti
B. Songhai
C. Benin
D. Mali

43. Which of these ancient kingdoms was located in Nigeria?

A. Songhai
B. Mali
C. Benin
D. Dahomey

44. The ancient Empires of Egypt and Assyria were ruled by

A. Kings.
B. Emperors.
C. Chiefs.
D. Czars.

45. The first British colony in West Africa to gain independence was

A. Nigeria.
B. Sierra Leone.
C. Ghana.
D. The Gambia.

46. The first Europeans to come to West Africa were the

A. Portuguese.
B. Spaniards.
C. English.
D. Dutch.

47. Which one of the following European nations did not participate in the partitioning of West Africa?

A. Britain
B. France
C. Germany
D. Norway

48. Which of the following was NOT a Justice of the Liberian Supreme Court?

A. W. V. S. Tubman Sr.
B. James E. Greene
C. Anthony Barclay
D. N. M. Russell

TURN OVER TO THE NEXT PAGE:-

49. The Liberian Constitution of 1848 was written by

A. Thomas Buchanan.
B. Goodloe Harper.
C. Simon Greenleaf.
D. Richard Gurley.

50. The International Commission of Inquiry sent to Liberia in 1926 by the League of Nations came to investigate

A. Liberia's request for a loan.

B. the charge of slave trading against Liberia.

C. the boundary problem between Liberia and French Guinea.

D. the trouble between the colonists and the natives.

51. The amount of money one pays for goods imported into a country is called

A. income tax.
B. customs duty.
C. excise duty.
D. austerity tax.

52. Which of the following is NOT a factor of production?

A. Land
B. Labor
C. Capital
D. Sports

53. An economic system characterized by a private property is

A. communism.
B. socialism.
C. capitalism.
D. fascism.

54. In Liberia what is the least amount of monthly salary on which income tax is deductable?

A. $75.00
B. $100.00
C. $126.00
D. $157.00

55. In Liberia, the Bureau of Customs comes under the Ministry of

A. Finance.
B. Agriculture.
C. Planning & Economics Affairs.
D. Commerce Trade and Transportation.

56. An appeal from the Clan Chief Courts goes directly to the

A. Paramount Chief's Court
B. Circuit Court.
C. County Commissioner's Court
D. Superintendent's Court.

57. A form of government in which the power to rule is vested in a few is

A. Tyranny.
B. Oligarchy.
C. Aristocracy.
D. Absolute Democracy.

58. The law that deals with the relationship of the individual to the state is the

A. law of equity.
B. private law.
C. public law.
D. civil law.

59. In Liberia, jurisdiction over complaints concerning violations of employees rights is generally held by the

A. Minister of Justice.
B. Minister of Labour.
C. Minister of Local Government.
D. Director of Civil Service.

60. To qualify for a Liberian citizen a foreigner must

A. be of Negro descent.
B. live in Liberia for a period of three years.
C. have a profitable business in Liberia.
D. have deposited $10,000.00 in a bank in Liberia.

THIS IS THE END OF THE EXAMINATION.

MATHEMATICS

Introduction

A Technique in Teaching Story Problems for Elementary, Junior and Senior High Teachers	Keith Winters PCV (Presented by Tom Walsh)
Word Problems	Tom Walsh Harper
A Three-Step Approach to Self-Paced Math Instruction	Ron Adams Voinjama
Preparing Students for the National Exam in Mathematics	Ed McFee Shelloe
HCF and Metric Conversion	Glenn Baaba Kolahun
Geometric Reasoning	Jaime Laracuente Grandcess
Grading: A Problem of Averages	Chuck Davis Heindii
First to Whatever Number--a game	Bruce McQuade Juarzon
Math Anxiety	Tom Wheeler

Introduction

As is evidenced by the following articles, there was much variety to the discussions held and presentations heard during the five Math content sessions. All that was done during the three-day period however, does not appear in this section in report form. While the write-ups need no further explanation here. I would like to comment briefly on some of the other discussions and one activity which are not given mention on the following pages.

In order for people to become acquainted (or re-acquainted, as the case may be) with each other, and as a way of initiating some thinking on both general and math-specific concerns, Bruce McQuade led a discussion on Sunday afternoon in which the following questions were posed:

- What topic did you find the hardest to teach?
- What topic was blown, and why?
- What was the biggest discipline problem which you encountered?, and What type of student behavior bothers you the most?
- What problems result due to a poor administration?

These questions were asked after we had split into three groups (about four in each group). On two occasions, after finishing with a question. the make-up of the groups was changed, giving a better opportunity for people to familiarize themselves with each other. At the completion of the last question, what had come out in the small-group discussions was briefly shared in one large-group discussion.

The responses to the questions were varied, and as many likely surfaced again in the "Problems Teachers Face" session, I will not attempt a compilation here. The primary value of Bruce's exercise was in the focusing of thinking upon issues which were to be discussed many times later in the course of the three-day workshop, and in the beginning of the thoughtful discussion which was to characterize the following four content sessions.

......../2

Most of the material appearing in the following reports was presented during Monday's sessions and during the first of the two Tuesday-morning sessions. The second session on Tuesday morning was composed of short presentations and discussions which are not found in the reports but deserve some comment.

Bill Hendrickson discussed and illustrated the solving of quadratic equations using the factoring -, completion of the square -, and formula methods, and also stressed the importance of showing students how the formula for solving quadratic equations is derived.

Tom Hankins reported on some success which he has had in getting students to copy material from the blackboard more quickly, and on his initial finding that many of the students already had the ability to write quickly, but had apparently never been encouraged to do so. Tom also presented a method, using Venn diagram and a table, to explain and to derive a simple formula for the solving of the "set union/intersection problem" which commonly appears on the 12th - grade national exam. Unrelated to either of the two previous topics, Tom talked about his posting of solutions to homework problems as a way of increasing the amount of attention being paid to him by the students as he is reviewing the problems at the board. With the opportunity given to the students for the copying of the solutions after class, Tom has been able to get the students to listen more carefully to what is being discussed in class.

During the same session, Tom Walsh demonstrated a simple bottle cap game which led to the playing of Bruce McOuade's "First to Whatever Number" game (similar in designing to Tom's). "First to Whatever Number" is explained in one of the following write-ups.

......../3

Tom Wheeler's discussion on "Math Anxiety" was held on Wednesday morning with the entire group of Math, Science, and Health Education teachers being present. His hand-out **appears** with the other reports.

The time spent in the content sessions was worthwhile. My thanks go to all of you who took part--though preparation time was short due to the fairly late sending of information on the workshop, the presentations and discussions were of high quality. Thank you also for bringing along your sense of humor.

Ed McFee
Shelloc

A TECHNIQUE IN TEACHING STORY PROBLEMS FOR ELEMENTARY, JUNIOR AND SENIOR HIGH TEACHERS

(presented by Tom Walsh)

For nearly all elementary, junior and senior high school students story problems seem to be one of the biggest mathematical hurdles to overcome. In an attempt to solve a story problem a student must first read and comprehend the ideas being expressed and then logically express this information in some sort of arithmatic or algebraic form. As a teacher your approach in teaching this area of math should be centered around these two ideas. Comprehension of the written problem and interpreting the problem in a mathematical form. The final step or what is called calculating the answer" is normally an easy and straightforward process.

There is no easy or quick method that develops a student's reading comprehension but rather a student slowly improves his or her reading ability through practice. Simplified word problems should first be introduced where the student will gain a sound understanding of basic mathematical terms that are commonly found in more difficult story problems (see additional sheet)__ These words at a junior or senior high level can easily be incorporated. Examples:

1) A common multiple of 6 and 9 would be?
2) A $3 50 can of Nido sold at $3 10 would have a percent discount
   of what?
3) The circumference of a circle with a radius of [illegible] inches is what?

At the elementary level similar but simplified examples could be·

1) The even number greater than 6 is?
2) One third of 27 equals?
3) How many quarters (25¢ will make five dollars ($5.00)?
4) The average of 7 and 9 is?

In addition to mathematical terms a vocabulary list should be introduced to your students that covers the four basic mathematical operations and equality. With this list the students will be able to directly interpret a word within the story problem to its mathematical operation (see additional sheet.) A class activity for interpreting these words could be as simple as "filling in the blank". Examples:

1) Esther is three years younger (____________)than Agatha. If
   Agatha is (_____) 19 years old now. how old is Esther? ans_____
2) A whole number is doubled (______) and the result is 14. What is
   the whole number? ans.________.
3) A twelve foot plank is cut (_______) into three equal pieces. Each
   piece will be (______) how long? ans._____

The most difficult story problems result from a combination of mathematical terms and words found in the vocabulary list. These problems should be introduced only after the student has shown some development in reading comprehension and a basic understanding of word interpretation. Examples at the junior high or senior high level are:

1) if one side of a square is increased by 2 feet and an adjacent side decreased by 2 feet, a rectangle is formed whose perimeter is 40 feet. Find a length of a side of the square.
2) The result if 70 is increased by 10 percent is?
3) The sum of two variables is 63. If one variable is 6 times the other variables, find each of the variables.

For elementary students a simplified version could be:

1) 5 weeks ago Kwia was born. How many days old is Kwia today?
2) School begins at 8:00 a.m. and each period is 45 minutes long. After the second period what will be the time?
3) Two inches shorter than one foot totals how many inches?
4) The product of 5 and the average of 7 and 15 is?

EXAMPLES OF MATHEMATICAL TERMS FOR JUNIOR AND SENIOR HIGH STUDENTS

solution, root, multiple, factor, square, cube, area, volume, perimeter, circumference, variable, unknown, rate, ratio, percent, commission, dividend, interest, discount.

EXAMPLES OF MATHEMATICAL TERMS FOR ELEMENTARY STUDENTS

less than, greater than, even, odd, whole number, fractional, half, third, quarter, ect.; decimal multiples; 2,4,6,8..... or 3,6,9,12.....ect.; rounding off, average, mean, ratio, pi, circle, cylinder, square, cube, area, square inches, feet, yards, ect.: volume: gallon, quart, pint, etc.: measurement: mile, yard, foot, inch, meter, weight: pound, ounce, gram: time: week, day, hour; money: half dollar (½), quarter (¼), cent ($\frac{1}{100}$)

VOCABULARY WORDS COMMONLY FOUND IN STORY PROBLEMS

for elementary, jr. and sr. high)

ADDITION	SUBTRACTION	MULTIPLICATION	DIVISION	EQUAL TO
increase	reduction	product	hald	result
more	difference	times	third	is
sum	less	double	fourth	will be
add	decrease	twice	quotient	are
older	ago	square	goes into	total
from now	younger	cube	cut	cost
exceeds	slower			
faster	diminished			
longer	shorter			
gained	lost			
how much	off			
	left			

WORD PROBLEMS

1. It is 18 miles from Harper to Pleebo, 24 miles from Pleebo to Nyaake and 53 miles from **Nyaake** to Kahnwiake. What is the total distance?

2. A moneybus travelled from Voinjama to Sanniquellie. It first went to Zorzor, 64 miles from Voinjama, then to Gbarnga. 70 miles from Zorzor. It then travelled to Ganta, 46 miles from Gbarnga, and finally to Sanniquellie 25 miles from Ganta. How long was the trip?

3 There are 156 days of school. If 14 days are off for holidays. 18 days are off for rain and 5 days off for funerals, how many days are left?

4. Three women were washing. One had 7 lappas to wash. the other two each had 13 lappas to wash. How many lappas were to be washed?

5. Five Kru boats were in from fishing. One caught 95 fish one caught 101 fish two each caught 152 fish, and one didn't catch anything How many fish were caught that day by the Kru, totally

6. Five women are in the market. Two each have 25 fish, three each have 19 fish. A boy buys 10. How many are left, in all?

7. You are selling fish. You have 12 pieces and you are selling them for 50¢ each. A woman next to you is selling fish at the same price, but she only has 9 pieces. How much more money will you make than her?

8. If Tom's family eats 3 cups of rice a day, how many days will 27 cups last?

9. There are 42 fish in the market. If 6 women each buy 7 pieces, how many will there be left?

10. If kerosene costs x cents for a bottle full, how many bottles can be bought for $4.00?

11 If rice costs y dollars for 100 lbs. how much can be bought for $50,000?

12. Victor has 3 footballs. If he gives 1 away, what fraction of the total will he have left?

13. Doe has 20 bananas If he gives 4 away what fraction of the total will he have left?

14. If it takes you 50 minutes to get to school and school starts at 8:40 a.m. when do you have to leave your house to make it there on time?

15. Add: 4hrs, 16mins, 6hrs 41mins., 6hrs., 25mins., and 2hrs., 42 mins.

16. Spider has 300 lbs, of rice he wants to move across a river. If the canoe he is using will only hold 75 lbs. and spider, how many trips will he have to make?

17. Spider falls into a hole 30 feet deep. Every day he climbs 3 feet up and each night he slips back down 1 foot while he sleeps how many days will it take him to get out of the hole?

18. It takes 800 palm nuts to make one gallon of palm oil. If a woman has 3½ gallons, how many palm nuts did she use?

19. A student takes 11 minutes to solve a problem. If he has 27 problems to solve how long will it take him in hours and minutes?

20. A farmer has a family of 9. If it takes 1/3 of an acre to feed one member how many acres must he brush to feed his family?

21 1 Cup of rice feeds two children. If you have 27 cups, you can feed 4 children for how many days?

22. A man makes palm wine every day. He taps 1½ gallons every day. If he does it for two weeks but takes Sundays off how many gallons will he have tapped?

23. A man is brushing his farm. He can brush 7/8 acre in one day. If he wants to farm 3½ acres how many days must he brush?

A market woman is selling peanuts. She sells ½ of her stock to a first customer, ½ the remainder to a second customer, and ½ of that reminder to a third customer. how much does she have left, expressed as a fraction of her original stock?

25. Euphemia is comparing prices in the store She can get 10 oz. of peanut butter for $1.75 or 28 oz. for $3.50. which is the better buy?

26 She is also looking at cheese. She can buy 6 oz. for $.50 or 18 oz. for $1.30. Which is the better buy?

27. She sees that sugar is selling for $.80 a lb. or $1.60 a kg. Which is the better buy?

28. A man wants [illegible] cases of Stout and 5 cases of Club for his daughter's wedding. Stout (24 bottles/case) costs 60¢ per bottle and Club (12 bottles/case costs 95¢ per bottle. How much does he need?

29. The mother is preparing Joll of Rice for the ceremony She knows it will take about 1½ cups of rice per person to feed the guests. If she uses 97½ cups of rice to make it, how many people is she expecting?

30. At the ceremony 20 people are palm wine drinkers and 12 are cane juice drinkers The palm wine drinkers each drink 2/3 gallon of that wine and the CJ drinkers each consume two quarts of their favorite How many gallons of country spirits were consumed at the wedding?

31. A farmer builds a fence around his farm. The farm is a 30' by 30' square farm. If he uses one post per foot, how many posts will he use?

32. Tomah has a farm that is 130 feet long and 240 feet wide What is the area of the farm in square feet? In acres?

33. A carpenter is building a table that is 6 ft. long and 4½. wide. What is the area of it in sq. ft.? In sq. yd.?

34. Yakpalo, the carpenter, is building a table that is 35 sq. ft. in area with a length of 7 ft. What is its width?

35. He is also making some benches. Two are to be the same size and the third must be one foot longer than the other two. If he has an 8 ft. plank for the bench tops, how should he cut the plank?

36.. An 11 ft board must be cut into three pieces. Two pieces must be the same size and the third must be two feet longer than either of the other two. How long will each piece be?

37.. Saki is building a round house with a diameter of 15 ft. What will be the area of the inside? (use =3.14)

38. Cassava is $.50 for a bunch of 6. If you have $3.00 how much cassava can you get?

39. You can make 28 blocks with one bag of cement. If you need 784 blocks, how many bags of cement must you get?

40. Blocks cost $.50 for one block. If you need 28 blocks, how much will they cost?

41. Three plantain cost 30¢. If you have $1.40, how much plantain can you get?

42. It is 71 miles from Kahnwiake to Tchien. If a moneybus makes the trip using 6 gal. of gas what is its mileage per gallon (MPG)?

43. It is 45 miles from Bomi Hills to Monrovia. If a moneybus uses 3½ gals. on the trip what is its MPG?

44. It is 18 miles from Harper to Pleebo. If a moneybus gets 10 MPG, how many gallons will it use to make the trip?

Tom Walsh. PCV Harper

A three step method for instruction

1. Gather data: give a pretest to find out where the student is now
2. Prepare specific instruction: this is to bring tke student up to desired standards
3. Evaluation. this will insure that the student has actually learned what you intended. A posttest can be used.

A diagram of the instructional process

Skill #1	pretest	instruction	posttest
Skill #2	pretest	instruction	posttest

The skills taught should be realistic and relevant for the student. Lessons should be prepared so that they start simple and spiral toward the complex. This will allow repetition and reinforcement.

An immense amount of initial work will have to be done by the teacher. Paper for tests and record keeping are necessary but alternatives like cassette recorders, overhead projectors and whatever else you can think of, can be used.

My experiences have been interesting. This program was originally planned for twelfth grade. I taught five sections my first year and got a basic idea on improvements for the next year classes. It turned out that I had to teach eighth and nineth grade this year. After some major alterations in problems and instructional content I waited for one period and started the program. Simply, I made every pretest too hard. No one could pass them. I abandoned the project until I covered the things I wanted covered, matched these with student abilities.

This whole approach is rather new to students and discipline has to be developed. I believe a positive attitude will develop about mathematics when the student accepts some responsibility for learning it and when a teacher helps guide this process.

..../3

Below are some thoughts which might be useful when you are ready to present an actual lesson.

- try to be flexible
- prepare a folder for each student that includes charts for tests scores and other pertinent information
- know what you want from the student and what is possible, then find a way to achieve your goals

Here are a few areas that might help you accomplish your instructional goals.

1. attention - get the student to focus on the details mentally and physically, that are important to master the skills
2. presentation - this is where you actually teach, there are three basic ways to do this.
    a. TELLING
    b. SELF GENERALIZATION
    c. MODELING
3. response - your goal is to get the correct response, the way you ask questions and make statements is extremely important
4. reinforcement - reward is one way to reinforce correct responses moving from a low-level reward is like candy and money, through touch and movement, to a higher-level reward like verbal praise or a smile or nod, no matter what reward you give, it must follow right after the correct response
5. practice - put simply "practice makes perfect" use games, puzzles, quizzes and other methodsto review material covered
6. application - the ability to use effectively the skills learned,is the true test of mastery;a mixture of the abstract and practical can be balanced to provide relevant exercises

A final Word

You might question the usefulness of these ideas. This program may not be realistic for your particular needs. My intent was to design a program that met the needs of high school students in a specific area with specific needs. There are limits to what can be accomplished in a given situation, but to find or establish these limits is an important part of the total process.

Ronald Adams, PCV
Voinjama, Lofa County
LIBERIA
July, 1980

Preparing Students for the National Exam in Mathematics

Building your students' confidence through an understanding of the nature of the exam, and through an exposure to specific, sometimes-overlooked techniques which can be used in the solving of certain types of exam problems:-

Teachers of 9th and 12 th grade mathematics in Liberia are usually faced with the problem of reconciling the need to present material at the appropriate level for their students with the need to provide enough preparation for the broad range of questions found on the national examination. As it is nearly impossible to cover all of the material which is found on the national exam, it is to the teacher's advantage if he/she can give his/her students some techniques for approaching and solving national-exam problems which involve not so much the ability to solve the specific problem completely as an understanding of the nature of a multiple-choice test. Estimation, elimination of "bad" answers, and substitutions are some of these techniques.

Students need to approach the national exam with the right attitude. It is an important exam. However, its difficulty and length (and often their realization that they don't know all of the material which appears on it) need not frighten the students to the point where they "choke". The teacher, in addition to reviewing the mathematical principles, concepts, formulas, and operations can spend some time with the students showing how some questions can be answered correctly without having a complete knowledge of the math which is involved. It is the purpose of this outline/discussion to encourage teachers of math to explain to their students as a secondary form of review, some additional problem-solving techniques which are unique to the multiple-choice type of exam, and which may, in addition to increasing confidence, increase the ability to use logical thinking.

........../2

Note: The problems which I have used as examples in the next section are taken from the '77, '78, and '79 Junior High Mathematics Exams. The "easy" solution which follows each example is my own, and many times may be the result of only one of the two or three possible approaches, each approach being equally reasonable

I. Understanding the nature of the exam

A. The exam consists entirely of multiple choice questions

B. There are questions which the students will not likelu be able to answer. The student should expect to see some of these questions

C. One of the four choices for each question is correct. After elimination, many times only two (and sometimes only one) choice will remain

D. Each question carries the same weight therefore no problems should be left out due to the spending of too much time on the more difficult ones. There may be "easy" problems located near the end of the exam.

II. Illustrating how a good dose of common sense can go a long way in the solving of some problems.

A. "Does not need to be answered completely", or "getting yourself in the right football stadium"

1 If 1 inch on a map represents 12 miles, what length will 3¼ inches represent?

A. 12 miles
B. 15¼ miles
C. 27 miles
D. 39 miles

Disregarding the ¼, and multiplying 3 by 12 gives an approximate answer of 36 is letter "D". The ability to multiply a fraction by a whole number or to convert a mixed number to an improper fraction is not necessary in order to choose "D" as the correct answer.

2. Divide $21x^3y^5z^2$ by $-3xy^2z$

A. $7x^2y^3z$
B. $63x^4y^7z^3$
C. $-7xy^3z^2$
D. $-7x^2y^3z$

........../3

When -21 is divided by -3 the coefficient of the entire quotient becomes a positive 7 (+7). At this point in the solving of the problem, a quick look at the possible answers, A–D, shows that only choice "A" contains a coefficient of +7. Without proceeding further, the correct answer is known.

B. "Narrowing the number of choices down by common sense".

1. A barrel of palm oil will last 15 weeks if 1½ bottles of it are used each day. How many weeks will the same quantity of palm oil last if 2½ bottles are used each day?

A. 63 weeks B. 25 weeks

C. 9 weeks D. 3 3/4 weeks

If the amount of palm oil used each day is increased the number of days that it will last has to decrease. Choices C and D are the only possible choices as they are less than 15. At this point, unless the student knows a method for actually finding the answer, it's time to make a guess. (The answer is "C")

C. "Common sense eliminates all but the correct answer"

1. Peter can cut a lawn in 2 hours and John can cut the same lawn in 4 hours. If both of them are working together, how long will they take to cut the lawn?

A. 1 hour 20 minutes C. 3 hours

B. 2 hours D. 6 hours

If Peter can cut the lawn by himself in 2 hours, then if someone helps him the job will have to take less than 2 hours. Choice "A" is the only one that is less than 2 hours.

2. What are the prime factors of 450?

A. 2,5,77 C. 2,3,5 5,9

B. 2,35 D. 2,3,3,5,5

The only choice which contains only prime numbers is choice "D". It must be correct.

........../4

3. If it takes 9 men 15 days to complete a job, how long would it take 5 men to do the same job?

   A. 27 days C. [illegible]4/5 days

   B. 8 1/3 days D. [illegible] days

If you decrease the number of men doing the job, it will take longer than 15 days to complete. The only possible choice is "A".

D. "Getting the answer by estimating, or by solving only part of the problem"

1. .525 x 1.02 is

   A. .5355 C. 53.55

   B. 5.355 D. 535.5

1.02 is so close in value to 1 that, in this problem, we are essentially multiplying .525 by 1. Expecting the exact answer to be very close to .525, we choose "A".

2. Add together 6.7, 18, 903.2, and 0.08

   [illegible] 912.5 C. 954.0

   B. 927.98 D. 972.0

Adding together only the whole-number part of the numerals gives a sum of 927. Choice "B" is the only one which is close to 927
Also, only one of the four numerals has a digit in the hundredths place, meaning that the digit will appear unchanged in the answer. The only answer containing an "8" in the hungredths place is "B".

E. Spotting Principles (or Properties)

In the following two examples, the alert student may see that a principle is being illustrated. Once the principle is spotted, the problem begins to look quite simple. (Nothing more will be said about these two)

1. Simplify: (2/3 - 1/7) ÷ (2/3 - 1/7)

   A. 11/21 C. 11/42

   B. 1 D. 8/21

........../5

2. Find n if 6(3+2) = 6x3+6xn

A. 12
C. 2
B. 6
D. 1/3

F. "Subsituting each of the four choices for the variable, or seeing which of the four choices satisfies the conditions of the problem".

In each of the following three examples, the student can find the correct answer by using each of the four choices given (see IC). Admittedly this can be a time-consuming process. However, if the student has looked through the exam and has completed all of those problems with which he/she feels comfortable, I advise him/her to go back and do these substitution-type problems. (Many students forget that one of these four choices that they are looking at is correct).

1. If 15-3x = 6, what is the value of x?

A. 3
C. 7
B. 5
D. 9

2. Solve for x: 5x/3+13+ 7x/3+15

A. 7
C. [illegible]
B. -42
D. -3

3. The number 17.211 is divisible by

A. 3
C. 6
B. 4
D. 11

III. Practice

Spend as much time as you can with your students (without taking too much time away from your regular math class) going over old exam problems. Many problems, either in exact or similar form, appear year after year on the national exam. Whether or not the problems repeat, exposure to national-exam-type problems is always helpful.

Ed McFee, PCV
Shelloe

Finding the HCF (GCF)

This method is applicable to arithmetic as well as algebraic problems. It is useful in finding the HCF of large numbers. An example will illustrate the method:

Example I: What is the HCF of 63 and 105?

Answer:

$$\begin{array}{r} 1R42 \\ 63\overline{)105} \\ \underline{63} \\ 42 \end{array} \qquad \begin{array}{r} 1R21 \\ 42\overline{)63} \\ \underline{42} \\ 21 \end{array} \qquad \begin{array}{r} 2R0 \\ 21\overline{)42} \\ \underline{42} \\ 0 \end{array}$$

There is no remainder hence the HCF is 21

Reasoning:

$$\frac{105}{63} \longrightarrow 105 = 63(1) + 42$$

$$\frac{63}{42} \longrightarrow 63 = 42(1) + 21$$

$$\frac{42}{21} \longrightarrow 42 = 21(2) + 0$$

1. 21 is a factor of 105 because it is a factor of 63 and 42.
2. 21 is a factor of 63 because it is a factor of 42 and itself.
3. 21 is a factor of 42 because it is a factor of itself.
4. 21 is the HCF because it is the largest factor of itself.

Example II: What is the HCF of 391 and 920?

Answer:

$$\begin{array}{r} 2R138 \\ 391\overline{)920} \\ \underline{782} \\ 138 \end{array} \qquad \begin{array}{r} 2R115 \\ 138\overline{)391} \\ \underline{276} \\ 115 \end{array} \qquad \begin{array}{r} 1R23 \\ 115\overline{)138} \\ \underline{115} \\ 23 \end{array} \qquad \begin{array}{r} 5R0 \\ 23\overline{)115} \\ \underline{115} \\ 0 \end{array}$$

There is no remainder hence the HCF is 23.

By Glenn Baaba
Kolahun

Metric Conversions

Arrange the prefixes as follows:

Kilo	hecto	deka	-	deci	centi	milli
K	h	dk	-	d	c	m

Example I: 15 km = ? mm

Answer: In order to get to milli from kilo, you convert 6 places to the right. Therefore, move the decimal point 6 places to the right:

15 km= 15000000 mm

Example II: 75 cg = ? g

Answer: cg to g is 2 places to the left therefore, 75 cg = .75 g

Example III: 307 hl = ? cl

Answer: hl to cl is 4 places to the right therefore, 307 hl = 3070000 cl

By Glenn Baaba
Kolahun

AN EXERCISE IN GEOMETRIC REASONING

By Jaime Laracuente - PCV - GRAND CESS

TOPIC OF EXERCISE -- GENERAL RULE FOR THE SUM OF THE INTERIOR ANGLES OF A POLYGON OF 'N' SIDES

180(N-2)

Teaching geometry in Liberias schools is usually a difficult task because the students in the past have been subjected to the Rote-Memory method of teaching. The student is not encouraged to develop his or her power of reasoning and the logical process is often compromised. The student is usually not encouraged to think on his own and is unable to enhance his grasp on the subject matter. In my teaching experience moreover, I have had difficulty with students who are unable to generalize after having observed certain patterns. It is therefore necessary to jump these hurdles before any serious geometric learning can be accomplished.

My presentation at the 1980 Education In-Service Meeting at Robertsport involves a simple exercise in geometric reasoning. It is an activity found in most geometry textbooks and adaptable to one's particular classroom setting. I was covering the topic of Polygons to a combined class of eleventh and twelve grades. Specifically, I wanted to teach the general rule for the Sum of the Interior Angles of a Polygon of 'N sides. The simple but very helpful textbook activity uses a chart to help the student actually see a pattern and then hopefully discover the general rule.

The student should first be aware of some polygon basics. The student should understand the meanings of such terms as verticles and diagonals of a polygon. He should also be able to draw a polygon of a given number of sides. However, please be reasonable: A polygon of ten or more sides is not easy to draw, even for the teacher. The teacher must also have covered triangles and the sum of the angles of triangles. Moreover, the student should have a knowledge of basic Algebraic terms, Expressions and Equations.

Now let's proceed with the exercise. Draw a chart similar to the one shown in Figure 1. Write in the indicated headings and allocate time in your lesson to explain clearly the meanings of each of the headings. In particular, the student should understand that the second column asks for the number of diagonals that can be drawn from one selected vertex. This idea is crucial to the success of the exercise. Appropriate Polygon figures should be drawn to strengthen the comprehension of this concept.

- Figure 1 -

NUMBER OF SIDES	NUMBER OF DIAGONALS FROM ONE VERTEX	NUMBER OF TOTAL TRIANGLES IN THE POLYGON	SUM OF THE INTERIOR ANGLES OF THE POLYGON
3	0	1	1 x 180
4	1	2	2 x 180
5	2	3	3 x 180
6	3	4	4 x 180
7	4	5	5 x 180
8	5	6	6 x 180
9	?	?	?
10	?	?	?
	?	?	?

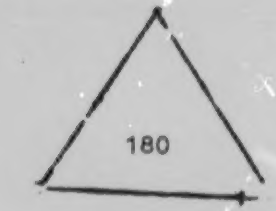
The chart in Figure 1 also shows the date filled in. The student of course will supply the date as he examines each polygon. Start with the simplest Polygon, the Triangle. Have the student actually draw the Polygon on the chalkboard and then fill in the information in the chart for the selected polygon. The teacher may find it necessary to do the first one or two polygons as examples. As each polygon is done the student should draw the diagonals and write the number 180 inside each of the triangles. After several polygons have been examined, the student should hopefully begin to observe certain patterns on the chart. For example, he may observe (with some guidance from the instructor) that the numbers in the second column are three less than the corresponding numbers in the first column. The student may also notice that the numbers in the third column are two less than the number corresponding with the number in the first column. These observations are basic and superficial but re important because they help to prepare the student for the goal you ant him to reach. Encourage the student to state to the class what atterns he has observed. Hopefully, the student will make such statements s the number of diagonals drawn from one vertex seems to be three ess than the number of sides of the Polygons,or he may observe that umber of triangles created by the diagonals is two less than the number sides of the polygon. Finally the student may see that the sum of the terior Angles of the polygon appears to be the product of 180 times the mber of triangles in the polygon. The next step is to have the student kip one or two polygons in the sequence and fill in the data for a new olygon without drawing the figure. For example, the student may do the irst eight polygons with drawings, but then he can be instructed to fill he data for a 9 sided polygon without doing the drawing. Once the student as filled in the data, have him draw the polygon as a self-checking step. is process can be repeated several times but my experience is that the tudents in general catch on fast.

The next step in this exercise is to have the student apply his nowledge of basic Algebra to formulate the rule for the sum of the nterior Angles. Since this is the purpose of the whole exercise a eview of Basic Algebra is advisable if the students are weak in the area. nce the student has seen the rule as suggested by the fourth column, 180)(N-2), he should be given the opportunity to test the formula for ther polygons. The student should be encouraged to draw the polygons ith diagonals. Figure 2 on the final page of this discussion shows several uch drawings.

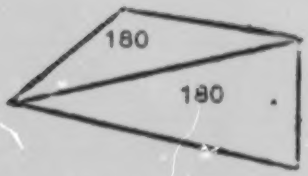
To summarize, this geometric activity has five main steps. First, he students draw the polygons and diagonals and fills in the date in the ppropriate columns of the chart. Secondly, after several polygons have een done, the student can be asked what if any patterns he has observed. hirdly, he can apply his observations to try to fill in the data of a ifferent polygon before drawing it. In the next step, the teacher shoul uide the student in formulating the rule. Finally, he applies the rule for ny polygon and checks his result.

There are two comments that should be made before closing this iscussion. Firstly, I made an error, I believe, by telling the students efore starting the exercise that there was a rule for finding the sum of he interior Angles of any polygon. The reason is that my students ppeared reluctant to formulate the rule on their own. Apparently ey have never had this type of exercise before. I sensed such negative attitudes that I almost decided to forego the exercise. However I stayed with the activity and was successful in converting their reluctance into an active interest in the exercise. My second comment refers to an interesting statement a student made when the class was asked for the number of diagonals that can be drawn from one selected vertex. The student remarked that, obviously, the number of diagonals must always be three less than the number of sides of the polygon. He reasoned and correctedly said that once a vertex is selected, that vertex plus the two non-consecutive vertices are automatically disqualified as vertices to which diagonals can be drawn. It was highly satisfying to have a student reason so well and the hope is that more students can be given the opportunity to strengthen their ability to reason by playing an active role in geometric exercises.

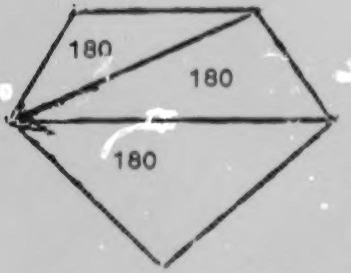
—FIGURE 2——



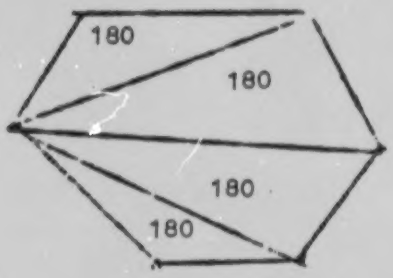
N= 3 0 DIAGONALS
1 TRIANGLE



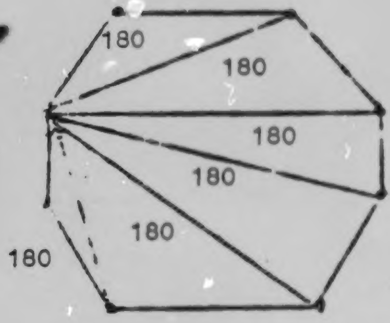
N= 4 1 DIAGONALS
2 TRIANGLES



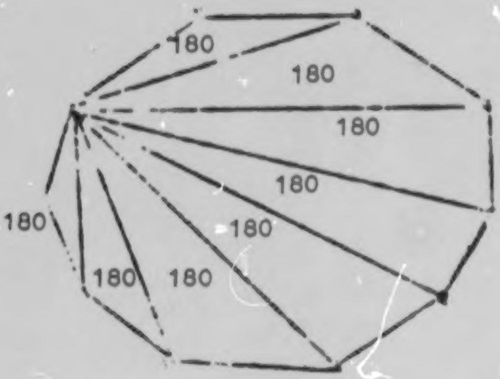
N=5 2 DIAGONALS
3 TRIANGLES


180
180
180
180

N = 6 3 DIAGONALS
4 TRIANGLES


180
180
180
180
180
180

N = 8 5 DIAGONALS
6 TRIANGLES


180
180
180
180
180
180
180
180

N = 10 7 DIAGONALS
8 TRIANGLES

Grading: A Problem of Average

Objectives:

A. Getting students to keep a record of their grades.

B. Teaching the concept of averages.

C. Building addition and division skills and learning how to find percent.

D. Decrease or eliminate the number of arguments concerning grades.

Discussion:

Last year I started the school session by giving an introductory lecture on finding the averages of different things: comparing heights of a number of students, their weights, ages, other factors that lend themselves to patterns which can be interpreted with averages. I tried to present the idea of percent by showing numerically that a person who gets four problems out of five correct will have a score of 80%. By giving many other examples and assigning problems based on actual student grades the concept became more clear.

Next term I will concentrate on finding percents. Changing fractions like 7/8 into an equivalent decimal then to percent, I hope, will help give a better understanding of my grading procedures and provide real problems for practice.

I decided to use each student's own calculation of their grade as a quiz. Those who got the right answers, got extra credit and students with incorrect averages, got less credit.

Chuck Davis

First to Whatever Number - a game

Pick any number, say 53. It becomes the goal. Next choose a range of digits, for instance 1 to 8. One of two players begins by picking a digit from the range. Example; the first player picks 8, then the second player picks 2. 8 and 2 adds to 10. The first player picks again, say 7 and that digit is added to 10, giving 17. The player who reaches the goal 53 wins. Here is a sample game:

	Choice	Sum
1st Player	8	8
2nd Player	2	10
1st Player	7	17
2nd Player	4	21
1st Player	5	26
2nd Player	8	34
1st Player	1	35
2nd Player	3	38
1st Player	6	44
2nd Player	5	49
1st Player	4	53 ←—— The Winner

There is a trick to it. In most case, as with 53 by 1 to 8 above, the player who goes first will win if he knows the right numbers to pick. You can see the "winning sequence" of numbers by adding 1 to the biggest number in the range; in this case 8+1=9. Next subtract 9's from 53. The "winning sequence" for the example is :

53-9=44
44-9=35
35-9=26
26-9=17
17-9= 8

........../2

Or 44, 35, 26, 17, 8. As long as a player picks so his/her number adds to the numbers in this sequence, the player will win. An easier way to use the "winning sequence" is to divide the goal number by 8+1 (or 9), then start with the remainder as the first pick. Example: 53÷9=5 R 8. Pick 8 first. Your next pick plus your opponent's should then add to a total of 9, bringing you to 17, the next number in the sequence. Continue increasing by 9 until you win. Play the game a few times; you will see.

Other goal numbers have other winning sequences but they are found by the same method.. Depending on the range of digits for some goal numbers, the player who picks second is in the winning position. Again, if you can discover how this works.

When presenting the game to students, don't give away the trick. Give them the chance to beat you by discovering the trick. When one does win ask the student to explain how he/she did it.

Bruce McQuade

MATH ANXIETY

Math anxiety is a genuine phenomenon that afflicts may people. Essentially it is a fear, a loss of self-confidence, a nervousness, that occurs whenever a person is expected to perform mathematically. This could be when a person has math homework to do, takes a math test, or makes a household budget. The degree of anxiety may range from something like mild stage fright---butterflies in the stomach--to a profound dread that may actually immobilize a person, keeping him or her from performing at all.

Because math anxiety is sufficiently widespread and can seriously limit a person's ability to function in a society that is increasingly pervaded by mathematics, it is worthwhile to examine what kinds of events induce math anxiety and escalate it and what suggestions teachers could use to minimize it.

During the pre-service training of math and science Volunteers in Frogmore, South Carolina, in January, 1980, a brainstorming session was held to elicit student experiences and teacher attitudes that promulgate math anxiety and to make suggestions for reducing it. Below is a summary of the efforts of these Volunteers.

I. SITUATIONS THAT CONTRIBUTE TO MATH ANXIETY

A. Student Experiences

1. Negative feelings from older siblings, parents, friends--even teachers--about how "hard" math is
2. Pressure from parents and peers to succeed in school--particularly in taking "tough" courses such as math and science
3. Fear of failing or otherwise not being able to measure up in the eyes of one's peers
4. A feeling of helplessness that can be traced to previous failures in other areas besides math
5. Intimidation by the necessity to learn a new language
6. Difficulty in dealing with a system of logic and precision that may be quite different from the logic that a person may have grown up with
7. Incomplete internalization of concepts and processes that are subsequently referred to only by abstract symbols

........../2

8. Intimidation by a lack of understanding of a particular math concept and feeling that he/she is the only one who doesn't understand
9. Intimidation by a teacher-- particularly in grade school-- for not being able to do some math problems correctly
10. An inadequate background in fundamental concepts of math upon which understanding of algebra and geometry depend
11. Not knowing where to start in attacking a math problem-- especially word problems
12. Pressure to perform within a given time constraint--especially on tests or blackboard drills

B. Teacher Attitudes

1. Thrill of frightening students by telling them that the subject or topic is going to be "hard"--a teacher ego trip
2. Being intimidating and insensitive to students' fears
3. Inability to get out of the language--i.e. can't seem to express a concept in everyday language
4. Lofty, intellectual; overly serious; inflexible
5. Priority on getting through the syllabus rather than on guaranteeing understanding by all students
6. Great emphasis on exams for determining grades rather than on other sources of evaluation information--e.g. class participation, homework, etc.

II. WAYS OF REDUCING MATH ANXIETY

1. Develop a classroom atmosphere of helping rather than one of threat
2. Give positive reinforcement for even the smallest point that is correct
3. Limit negative responses
4. Be sensitive to peer pressure and the identity crises that plague adolescents
5. Don't overemphasize the theoretical nature of math. Keep it relevant to everyday life
6. Individualize instruction (by means of modules) to keep from losing students (both weak and strong)

........../3

7. Make use of peer teaching (but be mindful of Suggestion 4 above)
8 Start a new topic gradually--with easy problems that are broken down into workable and understandable steps
9. Provide an interesting diversity in homework problems and test questions
10. Build confidence on tests by starting with easy questions
11. Make tests short enough for the given time period

By Tom Wheeler

Contents

Science Reading Kit List

Alternate Teaching Methods

How to organize a Science Debate
- Debbie Champagne Bailay

Problems of Discipline in a Small Class

Discipline in Large Classes

Presenting Concepts
- Janice Flahiff

Securing Books for Your School
- Edward Glumac

Supplies Necessary in a Science Lab

Value of Observation Exercises
- Michael Kammerdeiner

Changing Metric Units
- Dave Weinrich

Leaf Collection/Planetarium
- Jean Roden

Emphasize Math
- Deborah Hill

Homemade Ditto Duplicator
- Michal Kristie Mueller

SCIENCE

1980 In - Service, Robertsport

Science was a large, involved and enthusiastic group, sometimes augmented by math and health teachers as well. The diversity of the group added to the vitality of our sessions. The discussions were lively, the presentations helpful and informative. A great deal of credit is due to all who took part.

In addition to the other activities, several individuals wrote questions for for various science readings, thus helping to complete the kit which we hope to have available soon.

A list of the Science Readings and summaries of the presentations and discussions follows.

Michal Mueller

SCIENCE READING KIT LIST

PART I: PHYSICAL SCIENCE

1. Matter: 1. Atoms and Molecules
    2. Solids, Liquids, and Gases
    3. Boiling Point and Freezing Points
    4. Kinetic Theory of Matter
    5. Solutions

2. Electricity 1. Conductors and Insulators
    2. Volts, Amps and Ohms*

3. Energy: 1. Heat
    2. Fire *
    3. Behavior of Light
    4. Sound
    5. Energy today and tomorrow

4. Earth Science: 1. Types of Rocks*
    2. The Structure of the Earth
    3. Mountains that Smoke *
    4. The Materials and Forces of Nature

5. Weather: 1. Climates of the World
    2. Our Ocean of Air
    3. Types of Clouds

6. Astronomy: 1. The Planets
    2. Light Year
    3. Space, the Final Frontier

7. Machines: 1. Machines *
    2. Mechanical Advantage
    3. Friction
    4. Levers *
    5. The Law of Levers*
    6. Wheel and Axle *

PART II: LIFE SCIENCE

1. Health: 1. Nutrition.The Three Basic Food Groups
   2. Henry the Hookworm
   3. Man against Malaria

2. Botany: 1. Parts of a Plant *
   2. Angiosperms
   3. The Tropical Forest *

3. Man: 1. The Emergence of Man
   2. The Human Body *
   3. The Circulatory System
   4. Human Reproduction

4. Nature: 1. Environmental Science Introduction
   2. Amazons at War
   3. Evidence of Evolution
   4. Man and His Environment: Wildlife Society of Liberia
   5. Man and His Environment: Liberia's Wildlife
   6. Man and His Environment: The Gambia and its Future
   7. Man and His Environment: Full Circle
   8. Habitats of the Spaceship Earth

Alternate Teaching Methods

During a discussion on alternate methods for teaching science quite a few ideas were mentioned including games for practice or review and ways of getting the class more actively involved. Mark Hughes (Kanweaken) also gave a demonstration of some tried and true games.

These are included in the list below:

1. Concentration - matching 2 cards from many turned face down. Put words, symbols, definitions on cards.
2. Hangman (or it's opposite)
3. Food chain cards - arrange in order
4. Life Cycle cards - arrange in order
5. Oral Questions - like a spelling bee
6. Scavenger hunt
7. Flash Cards
8. Bingo - can use elements symbols, etc.
9. Dominoes - put a word on one end and a short definition on the other
10. Any regular card game can be played but make a new deck from metric prefixes to teach heirachy of values
11. Crossword puzzles
12. "What is wrong with the picture?"
13. Use analogous stories to illustrate concepts.
14. Word list charts
15. Students presentations (use a timer)
16. Play acting processes or changes of state, etc.

PROPOSED SCIENCE READINGS

Pressure and Temperature
Humidity
Winds
Air Masses
Fronts and Storms
Wedges
Inclined Planes
Ohm's Law
Parallel & Series Circuits
Magnetism
Stars & the Sun
Comets, Meteors, & Asteroids
Water Pressure, Buoyancy (Archimedes' Law)
Air Pressure

IN LIFE SCIENCE

Microorganisms
Growth of Bacteria
Protozons and Bacteria
The Cell: Building Block of Life
How Plants make food
The Digestive Tract
The Nervous System
The Respiratory System

Anyone interested in writing up new readings, from the suggested list above or your own ideas, is encouraged to do so.

Send the readings and accompanying questions in to the office.

HOW TO ORGANIZE SCIENCE DEBATES

I. Choose a topic which is stimulating and lends itself to debate. Also, select something which will broaden the students' knowledge. You may want to conduct your debate after a particular unit of study.

Topics: behavior and the brain, genetics engineering, evolution etc.

II. Formulate the question you debate is on. (Make it such that you have to answer "yes" or "no"):

Examples. Does the brain control so much of human beings' behavior that there is no such thing as free will?

- Is genetic engineering beneficial to mankind?

III. Decide on the number of speakers for each side.

I usually use 5 people on each team: 1 gives the introduction to their side; 3 give supporting evidence; 1 gives the concluding remarks for their side.

IV. Write the speeches for both sides. Being as little biased as possible. compose the students' speeches using good grammar, sentence structure, and a few new vocabulary words (science or other). Develop the sequence of your speeches so that they reach a climax.

V. Go to your class (es) and explain what you want to do. Ask for volunteers You may announce at this time that these people will receive extra credit. or whatever reward you have decided on. Make it clear that the volunteers have to practice with you at the time (s) or days you want. Choose a good time of the day for your students to practice.

VI. First Practice Session.

Explain very carefully what a debate is and how it is organized. Next, explain the selected topic. Lecture the students and discuss the topic. Ask for questions. Then tell the students that next time they will be asked to choose their side.

VII. Review what you did in the first practice session. Then describe the speeches under each side. Ask the students to choose their speech. Read the speech to each student, explaining its contents thoroughly. Help them with new vocabulary words.

VIII. Subsequent Practice Session.

Make very sure that each speech is understood by each student. Practice the speeches in the correct order. (pro, con, pro, con, etc) Be debate coach and help the students learn public speaking skills while they practice.

IX. Choose the date, time and place of debate.

As you see your debate members pulling together, select the date and time for your debate. Decide on who will be invited to attend. Then find a room large enough to accommodate everybody. You should also choose a panel of judges. Send out invitations in advance.

X. Rebuttals

Decide whether or not your teams could stage a rebuttal. If so, then describe it to the students and how a team may gain more points through it. Then disclose to one person on each team one place for rebuttal on their side.

XI. Day of the Dabate

Arrange the seating for your teams and judges.

Before the debate begins, introduce the purpose of the debate to the audience. Make sure that they understand the question of your topic. You may give an introductory background lecture for the benefit of the guests. Be sure they understand what the "pro" and "con" sides are trying to do.

Introduce each speaker. After the debate, call for the judges' collective votes. Allow one judge to reveal the final vote. Thank everybody for attending.

Problems of Discipline in a Small Class

The problems are numbered and underlined. The possible remedies or reactions are listed below.

1. Spying

Spacing

A & B tests - writing on brown paper, typing cover sheets

nothing on desk except paper

constant observation

Copying homework

group assignments

different assignments (individual)

classwork assignments

2. Late to class

time limit

have students leave

take grades for attendance

3. Talking out of turn

make an issue out of it

make rules and stick to it

4. Interruptions by students & staff

turn away students

be firm with staff - address staff outside of class

5. Joking - step on it or allow it

6. Outside noise

give students something to do

have older students supervise

bring case against absent/present teachers to principal

Try it!

It may be alot of work for you but you may find that: Your students and guests learned about how to hold an organized debate. They all learned more about that particular scientific question. And many may want to know when is the next debate planned and may they participate!

By Debbie Champagne Bailay

Discipline Problem in Large Classes	Solutions
1. Spying	
a. Personal conflict while admitting that a student spied	
b. Casual glancing	- put desk in front of class - make it as difficult as possible for them to cheat - don't make the punishment too severe - one group matched letters to numbers; the other group matched thenumbers to letters -"give me your paper" - be consistent - don't play favorites - your test is finished, you can leave - take paper away for 10 minutes
c. Changing answers after papers are passed back	- put "X" over the wrong part
d. Mass copying	- give different tests - will only count the ones which are different - call out the person's name
2. Late to class	- give pop quiz early to class and don't give it to the late people - sign "stand out - you are late" - you can't enter class after the teacher - "Class time is important" - if you interrupt my class, you can't come in tomorrow.
3. Talking out of turn	- won't teach until they are quiet - stop and look at the student (s) - put student out, 2nd time put them out for a week - say "Catch the door - send them out - "Close the door from the other side" - Walk to the area of talking

7. Militancy and strikes - not a problem in small classes
but if happens, have complaints put in writing and have students go through proper chanels
use School Committee for serious problems

8. Challenge to Authority; not problem with small classes but refer to a source (texts, etc.)
Don't get in conflict (over knowledge) with other teachers

9. Doing other work/reading - take it up

10. Failure to do homework - depends on importance

11. Classroom hogs - (teachers who don't leave at the bell) faculty discussion

13. Settling students palavers
take case to principal
settle problem after school

Possible Ways of Securing Books for your School

Sources

1. Ministry of Education - 7th floor - Zoe Caine
    a. Society of Liberian Authors - located behind the Executive Mansion. After getting permission from the Ministry you may sign for as many books as you want.

    b. Peace Corps Office - sometimes used books are donated to the Peace Corps.

    c. Book Donors (Intenational)

    1. Darien Book Plan, Darien Conn. 06820

    2. International Book Project, Inc. 17 Mostelle Park
    Lexington, Kentucky 40502

    d. Family, Friends Schools, (Churches,etc)

    1. Sometimes by writing your friends or parents in the States you can have them send you some books. The Peace Corps will put them in the Diplomatic Pouch if the books are sent to the Washington office, though there are restrictions.

    e. Book Stores

    1. National - corner of Ashmun & Carey Street

    2. Ministry Store - Street level of the Ministry Building.

    3. Captan Book Store (Broad & Randall (2 locations)

Transportation from Monrovia

1. Peace Corps - sometimes you can make use of the mail truck or one of the staff going going on an up-country visit

2. Rural Development Volunteers - make arrangements with one of the RD Volunteers in your area when they are in Monrovia

3. Other possibilities
    a. GSA - NFAA trucks

    b. Air Liberia - school activities fees

By Ed Glumac

4. Staff and Students interrupting
    - don't let other students
    - allow them*to to do it and then talk to individual teacher later after school - sign of respect

      * the teachers

5. Joking
    - make student (s) stand up
    - everyone, pay attention to so & so
    - pick up tempo of class

6. Outside noise
    - "you are all responsible"
    - peer pressure
    - give them the "evileye"
    - class president writes down names

7. Militancy

   Students challenge authority
    - don't get involved in volatile situations

8. Doing other work/reading
    - this is so & so class put that away
    - circulation

9. Failure to do homework

10. Class time hogs

11. Student palavers
    - throw out the students

Supplies Necessary in a Science Lab

1. Furniture - Robert Coleman
   Ministry of Education, 7th Floor
   - Have manual Arts teacher make some
   - Make it a class project
2. Glassware - Testtubes, stirring rods, graduate cylinder, tubing, beakers, flasks
3. Hardware - Alcohol burner, thermometer, balance (check Mandingo gold dealers), magnet, lenses, tuning fork, prism (can make from microscope slides & fill with water), dissecting kit, razor blades, pins, wire, flashlight bulbs, paper clips, pulleys, balloons, rubber bands, rubber tubing, weights, snips, file, rubber stoppers, aluminum foil, food cobring, parafin blocks and modelling clay (both Sinkor Supermarket) ping pong balls , clip boards (from ceiling file and clothes pins.)
4. Chemicals - Iron filing, sulphur Iodine HCl, litmus paper, lime

Value of Observation Exercises

1. Student - centered activity
2. Sense of awareness
3. Practice in observation, description and comparison
4. Reading, writing skills developed
5. Inductive reasoning practiced

By Michael Kammerdeiner

CHANGING METRIC UNITS

This is a simple method of changing between metric units (kilometers to centimeters) which allows students to do the operation even if they don't understand the math involved. The emphasis is on moving the decimal point the proper number of units left or right. To determine this, just write the metric prefixes in order, up and down or left to right:

Kilo Hecto Deka --- ---- Deci Centi Milli

If you have deciliters and want to convert to killileters, simply count the prefixes. "milli" is 2 prefixes to the right of "Deci" so you move the decimal point 2 places to the right.

Examples: 2.5 dl = 250. ml
2.5 dl = .0025 hl

If you count to the right, you move the decimal to the right. And if you count to the left, the decimal is also moved to the left.

By Dave Weinrich

LEAF COLLECTION

A good project for the class.
Have them locate the different types of leaves. Dry and press them between papers under a weighted board. Mount the leaves with glue on paper and identify them.

Planetarium

This is something that could be used year after year. Take a huge box such as one from a refrigerator and make a small door in it. Cover the inside with dark paper or paint. Then paint in the constellations with luminous paint, drawing the lines between stars to make it easier for students to see them.

Once they see it on a small scale it's much easier for them to recognize star groups in the sky.

By Jean Roden

HOMEMADE DITTO DUPLICATOR

The "Recipe"
1 pint Glycerine
4 envelopes Knox gelatin
3 tablespoons sugar

Dissolve the gelatin in 1 cup of cold water. Mix with the glycerine and sugar. Bring to a boil and cook and stir for 7 minutes. Pour into a large (9 x 14") cake pan and bake for 20 minutes at about 300 degrees F. Cool undisturbed 24 hours.

TO USE:

First of all don't prepare your ditto master in the usual way or the copies will come out backwards Simply take out the tissue as normal then flip it over and write/draw/type on the back, not on the white front side. This may be a bit hard on the eyes as ditto usually have their brand name all over the back, but squint and carry on.

Wet the "Jelly" surface with a sponge using COOL water. Blot excess water with paper towel or toilet tissue. Apply your ditto master face down - one end first and smooth it on to the jelly. Rub slightly. Allow about 30 seconds for the ink to transfer, then remove ditto. Make copies by smoothing on a piece of paper, then removing by pulling up and away from you. When finished, sponge surface immediately using LUKEWARM water until the copy has been erased from the surface.

GOOD LUCK

By Michal Mueller

MINISTRY OF EDUCATION

Secondary School English Curriculum

Grades 7 - 12

Contents:

Aims and Objectives

Syllabus

Team:

A. Doris Banks Henries

Edmond Kloh

TAMLE OF CONTENTS

PAGE

Introduction i

Overall Stament iii

Part I iii

Part II - Composition and Grammar iii

Part III - Reading and Literature iv

Ministry of Education - Secondary School Curriculum English - Language & Liturature Aims and Objectives 1

Grade Seven 1

- Composition and Grammar 1
- Reading 1
- Literature 2

Grade Eight 2

- Composition and Grammar 2
- Reading 2
- Literature 3

Grade Nine 3

- Composition and Grammar 3
- Reading 4
- Literature 4

Grade Ten 4

- Composition and Grammar 4
- Reading 5
- Literature 5

Grade Eleven 5

- Composition and Grammar 5
- Reading 6
- Literature 6

Grade Twelve 7
- Composition and Grammar 7
- Reading 7
- Literature 7

TABLE OF CONTENTS (cont'd.)

	PAGE
English Majors	8
Grade X - Speech	8
Aims and Objectives	8
Grade XI - African Writers	8
Aims and Objectives	8
Grade XII - Drama	8a
Aims and Objectives	8a

Scope and Sequence Charts

Grade VII - English - Language and Literature	9
Unit I - First Semester	9
Unit II -	10
Unit III	11
Unit IV - Second Semester	12
Unit V	13
Unit VI	13
Grade VIII - English - Language and Literature	15
Unit I - First Semester	15
Unit II	16
Unit III	17
Unit IV- Second Semester	17
Unit V	18
Unit VI	19
Grade IX - English - Language and Literature	20
Unit I - First Semester	20
Unit II	21
Unit III	22
Unit IV Second Semester	22
Unit V	23
Unit VI	25
Grade X - English - Language and Literature	26
Unit I - First Semester	26
Unit II	27
Unit III	28
Unit IV - Semester Examination - Second Semester	28
Unit V	29
Unit VI	29
Grade XI - English - Language and Literature	31
Unit I - First Semester	31
Unit II	32
Unit III	33

TABLE OF CONTENTS (CONT'D.)

PAGE

  Unit IV- Second Semester 33
  Unit V 34
  Unit VI 35

Grade XII-- English -- Language and Literature 37

  Unit I- First Semester 37
  Unit II 38
  Unit III

Review of First Semester 38
  Unit IV -- Second Semester 38
  Unit V 39
  Unit VI 39
English --- Language and Literature As a Major 40
Grade X- Speech 41

  Aims and Objectives 41
  Unit I -- First Semester 41
  Unit II 41
  Unit III 41
Review of First Semester's Work 42
  Unit IV- Second Semester 42
  Unit V 42
  Unit VI 42

Grade XI - African Authors 43

  Aims and Objectives 43
  Unit I - First Semester 43
  Unit II 43
  Unit III 44
  Unit IV - Second Semester 44
  Unit V 44
  Unit VI 45
Grade XII - Drama 46

  Aims and Objectives 46
  Unit I - First Semester 46
  Unit II 47
  Unit III 47
  Unit IV - Second Semester 48
  Unit V 48
  Unit VI 49

The Secondary School Curriculum Development 50
Scheme of Evaluation 50

Foreword

TABLE OF CONTENTS (cont'd.) PAGE

Grade VII 52

Unit I 52
Unit II 53
Unit III 55
Unit IV 57
Unit V 58
Unit VI 59

Grade VIII 61
Unit I 61
Unit II 62
Unit III 64
Unit IV 65
Unit V 66
Unit VI 67
Grade IX 68

Unit I 688
Unit II 69
Unit III 71
Unit IV 72
Unit V 73
Unit VI 74

Grade X 76

Unit I 76
Unit II 77
Unit III 78
Unit IV 79
Unit V 80
Unit VI 82

Grade XI 84

Unit I 84
Unit II 85
Unit III 87
Unit IV 88
Unit V 89
Unit VI 90

Grade X II 92

Unit I 92
Unit II 93
Unit III 94
Unit IV 94
Unit V 95
Unit Vi 96

TABLE OF CONTENTS (CONT'D.) PAGE

Speech - Evaluation 97

African Authors - Evaluation 99

Grade XII Drama - Evaluation 102

Books for Specific Emphasis in Literature 105

Africa Writers 107

Drama 108

Bibliography 109

INTRODUCTION

Secondary Curriculum Writing
English-Language and Literature
Liberian Literature
World Literature
African Literature

The Curriculum Writing Team for Secondary Schools decided upon an integrated approach to Teaching Language Arts - English in the educational system. Therefore in the area of Composition and Grammar as well as in the area of Reading and Literature, activities include experiences in other subject areas such as social studies, science, and vocational education. The Aims and Objectives reflect this ideal. Besides integrating subject areas the committee has also integrated Composition, Grammar and Literature.

It is also noted that much of the Composition and Grammar is to be developed on an expanding basis. Fundamentals are taught at each grade level 7 - 12; but the emphasis is slightly different for the various grades.

The Team would like to recommend in the senior high school as follows:

Grade 10 - World Literature
Grade 11 - Literature of England and the United States of America
Grade 12 - African Literature

Due to textbook constraints this was not feasible; therefore the team recommends integration of African Literature in Grades 10 - 12 as follows:

Grade 10 - World and African Literature
Grade 11 - U. S. and African Literature
Grade 12 - English and African Literature

The Curriculum in the secondary school includes English, Liberian, World and African Literature; therefore the title assigned to the writing was changed to suit the content at various grade levels.

OVERALL STATEMENT

The Secondary School English: Language Arts, Literature Curriculum

Part I

The aims and objectives of any subject area of the curriculum including, English-Language Arts and Literature, should be to achieve national and educational goals of Liberia. Since language is for the purpose of communication and furthering knowledge, it is related and basic to all subject areas. Proficiency and efficiency in language, oral and written, profoundly influence success in the school program for normal students. In order to be effective it is necessary to integrate the English program with all subject areas.

Part II

Composition and Grammar

Oral and written communication requires facility with language skills. For this reason the curriculum must provide for achievement of the following general aims:

1. Identification and use of parts of speech
2. Recognition and use of types of sentences, parts and patterns
3. Development of paragraphs, structure and elements
4. Development of mechanics of composition: capitalization, spelling, punctuation
5. Writing short and long compositions
6. Developing research skills, outlining, note-taking, use of library and dictionary

7. Writing letters of various types

8. Improvement of speech, use of voice and body, articulation, pronunciation, enunciation

9. Development of skills in creative writing

Part III

Reading and Literature

Besides oral and written composition skills young people must strengthen their ability to read as well as have an understanding and appreciaiton of literature. In this area the general aims are as follows:

1. To develop ability to read with speed and comprehension

2. To develop vocabulary

3. To foster a love for reading

4. To strengthen the reading habit

5. To encourage use of the library as a source of knowledge

6. To broaden interests in literature related to all aspects of life and other subject areas

7. To refine tastes and appreciation: discrimination through experiences with good and poor reading materials, establishing criteria for evaluating literature of high quality, recognizing literature of lasting value which enrich life, developing interest in the beautiful and artistic

8. To acquaint students with authors and writing styles together with an understanding of ideals of past and present cultures and contributions of authors to the advancement of mankind.

Part IV

English Majors

For students who desire to major in English there will be in-depth studies in specific courses. It is suggested that the following be taught:

10th Grade - Speech

11th Grade - African Authors

12th Grade - Drama

Speech

The general aims of the course in Speech are as follows:

1. To improve the art of oral communication
2. To enable the individual to hold attention of and inspire a favorable response from a person or audience
3. To develop ability to make impromptu and formal speeches
4. To develop bodily aids to effective speech
5. To develop ability to interpret emotions through speech

African Authors

The general aims of the course on African Authors include:

1. To develop appreciation of African folklore
2. To acquaint student with African writers
3. To develop understanding and appreciation of African literature
4. To insure that students have a knowledge of themes and styles in African writing
5. To enable students to recognize types of African literature

Drama

The general aims of the course in drama are as follows:

1. To develop interest in and appreciation of drama
2. To acquaint students with the historical development of drama
3. To develop in students the ability to act in a drama
4. To develop knowledge of types of drama

Ministry of Education
Secondary School Curriculum
English - Language and Literature

Aims and Objectives

Grade Seven

1. Composition and Grammar
   To strengthen ability to:

   a. Identify types of sentences and sentence patterns

   b. Recognize parts of sentences

   c. Punctuate sentences

   d. Recognize and correctly use parts of speech

   e. Use the dictionary

   f. Take notes and make outlines

   g. Write good compositions

   h. Achieve speech improvement in:

      Voice quality
      articulation and pronunciation
      speech and conversation

   i. Bring about vocabulary development
      building from root words
      getting meaning from context
      synonyms, antonyms, homonyms
      dictionary skills

   j. Develop listening skills

      purpose
      critical listening
      showing courtesy and appreciation

   k. Develop reading skills

2. Reading
   To insure achievement in:

   a. Strengthening ability to read with speed and accuracy

   b. Improving comprehension in reading

   c. Developing vocabulary

3. Literature

   a. To Develop Knowledge and Appreciation of Liberian Authors and their works through:

      1. Oral literature
      2. Written 19th Century Literature
      3. Written 20th Century Literature
      4. Reporting on one Liberian author
      5. Poetry reading and exercises

   b. To identify time, place, setting and mood of a given story. Paragraph writing, identifying each

   c. To require student reports: on collateral reading, oral and written - identifyin main characters, theme, plot and setting

   d. To develop ability to write one biography of a Liberian

   e. To have students: read for comprehension pleasure and appreciation

   f. To develop literary tools

   g. To develop skill in proof-reading a book report

Grade Eight

1. Composition and Grammar

   To expand and strengthen knowledge and skills in:

   a. Use of parts of speech, emphasis on verbs: tenses, conjugation

   b. Use of word forms and sentence parts, punctuation and usage-compound subject and verb

   c. Oral English, speech

   d. Writing compositions, essays, letters

   e. Vocabulary development

   f. Use of dictionary

2. Reading

   To develop ability through:

   a. Continuing improvement in speed and comprehension
   b. Expanding vocabulary
   c. Increasing appreciation

3. Literature

To enlarge comprehension and appreciation of literature by:

a. Reading with a critical approach, writing a critical analysis of the author studied

b. Reading a short story and identifying the plot, setting and theme by responding orally to questions of the teacher

c. Reading a poem and analyzing the meaning in a written exercise, including translating it into prose

d. Identifying authors

e. Reading a short story, poem or essay and identifying the theme, climax, conflict and resolution of the conflict in writing

f. Studying poetic skills and correctly mark an unfamiliar poem

g. Writing two paragraphs on an author showing his excitement and/or energy in a given selection

h. Studying, defining and giving examples of figures of speech, similes, metaphors, personification

i. Studying 5 kinds of conflicts-identifying and describing each in writing: Man vs Man, Man vs Society, Man vs environment, Man vs nature, nature vs nature

j. Reading and describing the mood in 10 unfamiliar poems

K. Composing 3 original poems in forms assigned by the teacher

l. Reading and understanding the main forms of dramatic writing and describing the major characteristics of each

Grade Nine

1. Composition and Grammar

To strengthen and expand knowledge of:

a. Parts of speech

b. Structure and kinds of sentences

c. Dictionary skills

d. Vocabulary Development and Spelling

e. Punctuation and Capitalization

f. Note taking and outlining

Composition

g. To strengthen competencies

h. Writing multi-paragraph papers

i. Writing a short story

j. Making book reports
Writing biographies

Writing in subject areas

k. Improving oral expression and speech

l. Developing library skills

m. Writing friendly and business letters

2. Reading

To insure:

a. Continuing improvement in speed, comprehension, vocabulary and appreciation

b. Interest in the use of the library for educational improvement through specific assignments

3. Literature

To study Liberian and African authors for understanding

a. Short stories, setting, characters, plot and conflict, climax and theme

b. Humorous, lyrical, narrative and thematic poetry and identifying figures of speech, images and symbols

c. Historical novels and tracing development of one major character, bringing out meaningful events in the plot in correct sequence; and relating the social and historical background to the period for which it was written

d. To engage in reading 2 novels and writing essays on their setting, plot, character development, conflict, theme and climax.

e. To strengthen ability to write book reports

Grade Ten

1. Composition and Grammar

To expand and strengthen abilities in:

a. Usage

b. Parts of speech

c. Sentence structure, kinds and analysis

d. Capitalization and punctuation

e. Vocabulary development and spelling

f. Creative writing

g. Writing compositions based on subject areas eg. science, social studies

h. Writing business letters

i. Speech

2. Reading

a. To insure:

a. Continuing improvement in speed, comprehension and vocabulary

b. To improve ability in using the library in life long education

3. Literature

To study the world of literature including Africa

To develop knowledge and appreciation of mankind through:

a. Studying of biography

b. Studying of short story

c. Studying of poetry

d. Collateral reading and reporting

e. Reading two novels, writing summaries, identifying main character, describing setting, plot, climax and theme

f. Studying and participating in performance of a drama

g. Completing one research project

Grade Eleven

1. Composition and Grammar

To insure competence in:

a. Writing effective sentences, compound and complex

b. Grammatical usage

c. Writing meaninful paragraphs

d. Research techniques and tools involving the following activities:

1. Locate 20 books and periodicals in the library

2. Write 10 bibliography cards each from books and periodicals

3. Identify structure of the library by identifying all catagories of the Dewey Decimal System

4. Develop a thesis-oriented topic for a research paper to be completed the first semester

5. Identify foot notes and bibliographical entries from a list of 40 works

6. Prepare notes on note cards

7. Write direct and indirect quotations from a list of 20 given by the Teacher

e. Recognition of parts of speech

f. Writing of a resume

g. Writing business letters

h. Writing an autobiography

i. Reasoning by logic and analogy

j. Learning meaning and use of diacritical marks

2. Reading

Continuation of emphases on developing abilities indicated in previous grades

3. Literature

To develop knowledge and appreciation of the Literature of Africa and the USA including:

a. Folk literature

b. 19th Century African Literature

c. 20th Century African Literature

d. Literature of the USA 18th, 19th and 20th centuries

Poetry
Short stories
Novels
Drama
Essays
Journalism

e. Collateral reading and reports

f. Participation in one drama

g. Creative writing

Poetry
Short stories
Play
Essay

- h. Writing a biography
- i. Identifying theme, setting, plot, climax
- j. Completing one long research project

Grade Twelve

1. Composition and Grammar

   To strengthen and improve skills in:

   - a. Recognizing and using sequence of tenses
   - b. Paragraph development - Unity, coherence, and point of view
   - c. Vocabulary development
   - d. Usage
   - e. Precis Writing - Compression of ideas
   - f. Logic - inductive and deductive reasoning
   - g. Reasoning by analogy
   - h. Logically developing the topic sentence
   - i. Creative Writing
   - j. Library techniques - Research
   - k. Formulating the thesis statement

2. Reading

   To develop skill in reading in support of all subject areas - with comprehension, speed and accuracy.--continuation/culmination of emphases.

3. Literature

   To study English literature to gain knowledge and appreciation through:

   - a. Study of Anglo-Saxon poetry characteristics
   - b. Study of Medieval poetry
   - c. Study of Elizabethan poetry
   - d. Study of poetry of the Romatic period and
   - e. Study of short stories
   - f. Writing essays on themes, and characterization
   - g. Writing sonnets, myths and plays
   - h. Writing character sketches
   - i. Reading and reporting on novels and other types of literature

Reading

To develop skills in accuracy, comprehension and speed by reading in support of all subject areas:

Creative Writing

To develop writing skills through

a. Studying and writing essays
b. Studying and writing poems
c. Studying and writing dramas
d. Studying and writing short stories
e. Compiling a booklet on personal writing
f. Constant review of composition and writing tools and skills

ENGLISH MAJORS

Grade Ten - Speech

Aims and Objectives

1. To improve ability to speak effectively
2. To improve voice and articulation
3. To learn basic rules of parliamentary procedure
4. To develop ability to interpret literature
5. To develop skills in conversation and debates
6. To develop ability to make public speeches

Grade Eleven - African Writers

Aims and Objectives

1. To develop appreciation of the significance of Folk Literature
2. To develop appreciation of African poetry including:
    a. Folk poetry
    b. Nationalistic poetry
    c. Post independence poetry
    d. Negritude poems
3. To develop appreciation of African short stories
4. To develop interest in essays on African life
5. To develop appreciation of African drama
6. To give students exposure to African novels

AIMS AND OBJECTIVES (continued)

Grade Twelve - Drama

Aims and Objectives

1. To develop an understanding and appreciation of the significance of drama
2. To acquaint students with Greek and Roman drama
3. To help students understand medieval or early drama
    a. Mystery play
    b. Miracle play
    c. Morality play
4. To acquaint students with features of drama of various periods
    a. Elizabethan and Renaissance drama
    b. 16th and 17th century comparative drama
    c. 18th, 19th and 20th century American drama
    d. 20th century African drama

JUNIOR HIGH SCHOOL
SCOPE AND SEQUENCE CHART

Area	Seventh Grade	Eighth Grade	Ninth Grade
1. Grammar	Identifying parts of speech types of sentences, sentence patterns. Recognize parts of sentences, and punctuate sentences correctly. The correct use of verb and subject, correct form and use of verbs, nouns, pronouns, and modifiers. Use of dictionary vocabulary building, synonyms, antonyms, homonyms.	Expand skills in the use of parts of speech, emphasis on verbs, tenses, sentences, conjugation, word forms and sentence parts, punctuation and usage-compound subject and verb. Vocabulary building, use of dictionary skills.	A new approach to language analysis, parts of speech and verbals. Parts, structure of a sentence, the phrase, the clause, the completed sentence, Agreement of subject and verb. Pronoun usage. Correct form and use of verbs. Capitalization and punctuation, end mark and commas. Vocabulary building.
2. Writing	a. Writing good compositions, note taking and making out-lines, writing, social and business letters, paragraph writing	Writing compositions, essays business, and social letters and reports.	Writing [illegible] multi-paragraph papers essays, book reports, friendly and business letters. Rewriting sentences that don't make sense. Using comparisons and revising reports and short stories.

3. Speaking	Use of body and voice, improving speech, giving speeches and evaluating progress: panel, round table forum, symposium	Improvement in speech, public speaking	Public speaking: debates lectures, descriptions, etc/
4. Reading	Speed comprehension, vocabulary appreciation, library.	Comprehension, vocabulary appreciation, information, dictionary	Comprehension, vocabulary appreciation information, style
5. Literature	World Literature, character development, plot, mood, setting, climax; collateral reading, book reports, characteristics of novels. Folk literature African poetry	African and US, literature Period Literature Study of U.S. and Africa fiction, non-fiction, Drama and poetry, Collateral reading, book reports	English and African Literature Anglo-Saxon Literature Medieval Literature Nineteenth and twentieth century Dramatic forms, the theater
	Speech Voice, articulation, [illegible] pronunciation, enunciation, debates, interpretation public speaking	Specialization African Writers, Significance of Folk Literature African Poetry, short stories: essays on African Life; drama	Drama Readings, plays (children's, adults, one act, three act. Analysis of theme and character, Acting, production History of Theater.

SENIOR HIGH SCHOOL
SCOPE AND SEQUENCE CHART

Area	Tenth Grade	Eleventh Grade	Twelfth Grade
1. Grammar	Review parts of speech sentences. Building sentence with verbs, nouns, pronouns dependent clauses, capitalization and punctuation spelling. Diagramming sentences.	Review parts of speech agreement of subject and verb, clauses and phrases dictionary skills, word attack skills.	Review of grammar: parts of speech, sentences, clauses, phrases. Diagramming
2. Writing	a. Building paragraphs: Topic sentences, unity and cohesion b. Writing themes c. Writing letters: complaint, request and inquiry, order application d. Creative writing essays, short stories, poetry, autobiography	Techniques of writing: paragraphs, thematic, opinions, essays, creative writing; drama, poetry, guides to research, choosing subject, main topics, sub-topics, preparing outline, locating source materials, taking notes, preparing bibliography cards, documentation. First draft, final draft of research paper	2. a. Writing colleges and businesses, reports on collateral reading b. Creative writing: poetry short stories, essays, plays c. Writing biographies

. Speaking & Listening:	Achieve speech improvement in: Voice quality, articulation and pronunciation, speech and conversation. Develop-listening skills. Critical listening, showing courtesy and appreciation.	Speaking-Oral English, speech and conversation.	Developing skills for verbal intelligence, organizing thoughts for effective oral communication, learning parlimentary procedures. Use of body and voice.
. Reading	Speed, comprehension, vocabulary	Speed, comprehension, vocabulary appreciation	Speed, comprehension, vocabulary appreciation, use of library
.Iterature	Liberian authors and their works, Oral literature, written, 19th and 20th century literature. Report on a Liberian author. Poetry, The study of time, place, setting, mood of a story, collateral reading. Identifying characters, theme, and plot. Writing the biography of a Liberian and writing a book report. Liberian Folklore.	Identifying authors, theme climax, conflict and resolution, plot, setting Poetry - Liberian and African. Figures of speech, translation of poetry into prose. Study of poetic skills. Critical analysis of poems and authors studied. Other literary work.	Biographines and Autobiographies of Liberian and African authors, symbols, and images, figures of speech Author's craft: setting plot, theme, conflict, climax and character development. Reading a historical novel and tracing development of major traits as they occur in the plot.

GRADE VII

ENGLISH - LANGUAGE AND LITERATURE

CONTENT: ACTIVITIES-SYLLABUS

FIRST SEMESTER

UNIT I

(SIX WEEKS)

A. Grammar:

1. Writing types of sentences - declarative, interrogative imperative, and exclamatory
2. Defining types of sentences
3. Recognizing sentence patterns - pattern I: Subject and predicate
4. Pattern 2: Subject, predicate, and direct object
5. Strenghening vocabulary - synonyms, antonyms, homonyms

B. Composition:

1. Expressing ideas clearly and effectively in sentences
2. Engaging in creative writing
3. Arranging sentence parts effectively.
4. Involving students in Writer's Club and class organization
5. Pursuing accurate articulation and pronunciation in conversation and discussion

C Reading

1. Reading fairy tales for speed and appreciation
2. Selected reading for comprehension two times weekly
3. Giving library assignments in selected reading for developing reading skills

D. Literature-Liberian Literature

1. Oral Literature: Folklore etc.
2. Written 19th century literature
    a. Defining and reading essays: (2) biographies (3) autobiographies
    b. Defining poetry, rhyme, rhyth, meter
    c. Studying drama; A Liberian Play

UNIT II

(SIX WEEKS)

A. Grammar

1. Recognizing parts of sentences
2. Sentence pattern 3: Subject, predicate, indirect object, direct object
3. Recognizing and correctly using parts of speech - conjunction, noun, verb, adjective, pronoun, adverb preposition, interjection
4. Using transitive and intransitive verbs
5. Strengthening vocabulary - prefixes and use of the dictionary
6. Using the library

B. Composition

1. Engaging in writing effective paragraph, creative writing
2. Class organization activities
3. Linking sentences in a paragraph
4. Opening a discussion, and making introductions
5. Sticking to a point in discussions

C. Reading

1. Reading selected prose and poetry for developing writing skills
2. Involving students in readings in various subject areas
3. Engaging in reading selected poetry for appreciation

D. Literature - Liberian Literature

1. Written 20th century Literature: 1. Folklore, 2. Essays, 3. Biographies (class booklet)
2. Involving students in the study of time, place, setting and mood of a given story, paragraph writing identifying each
3. Identifying figures of speech: Simile, metaphor, personification

UNIT III
(SIX WEEKS)

A. Grammar

1. Using linking verbs, verb phrases, singular and plural verbs
2. Agreement of subject and verb exercises
3. Recognizing tenses of verbs, and principal parts of verbs
4. Using modifiers - adjectives, adverbs
5. Recognizing sentence pattern 4: Subject and linking verb, and predicate noun
6. Developing vocabulary - words and the use of dictionary. Using words from passages read (Review - Semester Exams).

B. Composition

1. Formulating and developing topic sentence
2. Engaging in creative writing, organization activities
3. Explicating sentences and paragraphs
4. Describing sentences and paragraphs
5. Critical speaking and listening
6. Asking effective and clear questions, and organizing talks
7. Making clear and forceful announcements

C. Reading

Reading selections for speed and comprehension

D. Literature - Liberian Literature

1. Reporting on collateral reading, oral and written
2. Identifying main characters, theme, plot and setting of a given story
3. Reading for comprehension, pleasure and appreciation
4. Poetry: meter, rhythm, rhyme
5. Drama: A Liberian Play (review and semester examination)

Semester Examination

SECOND SEMESTER

UNIT IV

(SIX WEEKS)

A. Grammar

1. Comparison of adjectives and adverbs
2. Recognizing phrases - prepositional, noun, adjective and adverb
3. Sentence patterns 5: Subject, linking verb, predicate noun
4. Developing vocabulary - taking meanings from context
5. Learning principal parts of verbs
6. Making a list of unfamiliar words for assignment

B. Composition

1. Engaging students in writing autobiographies
2. Writing introductions for speakers
3. Writing bulletin - board notices
4. Reading aloud and telling interesting stories
5. Interpreting what is being read
6. Speaking distinctly and interestingly

C. Reading

1. Reading selected prose for speed and comprehension
2. Reading selected prose and poetry for speed and appreciation
3. Reading selected work for strengthening skills in pronunciation

D. Literature - Liberian Literature

1. Understanding and appreciating the short story identifying main characters, theme, setting, plot, conflict
2. Poetry - creative writing, rhythm, meter, rhyme
3. Figures of speech - personification, simile, metaphor, metonomy
4. Drama - A Liberian Play performed

UNIT V

(SIX WEEKS)

A. Grammar

1. Using modifiers, adjectives, predicate adjectives, demostratives and adverbs
2. Using connecting words - prepositions, nouns as objects, conjunctions
3. Sentence patterns 6: Subject predicate, direct object, object complement
4. Vocabulary development - recognizing unfamiliar words, getting help from practice reading to build up a vocabulary
5. Assigning a list of unfamiliar words

B. Composition

1. Engaging students in writing social and business letters
2. Involving students in creative writing
3. Story - telling
4. Writing reports and making announcements

C. Reading

1. Reading selected works in all subject areas for reading skills
2. Engaging in library activities in selected reading based on individual interests

D. Literature - Liberian Literature

1. Short story: Studying theme, climax, conflict and resolution of conflict
2. Poetry - Poetry defined, rhythm, meter
3. Recognizing figures of speech: Metaphor, metonomy, personification and simile
4. Reading a drama: A Liberian or any other African play

UNIT VI

(SIX WEEKS)

A. Grammar

1. A review of types of sentences and sentence patterns
2. A review of vocabulary development

3. A review of parts of speech, linking verbs, verb, noun, adverb and adjective phrases, tenses, and principal parts of verbs
4. A review of agreement of subject and verb
5. A review of modifiers

B. Composition

1. A review of accurate articulation and pronunciation
2. A review of creative writing
3. A review of effective paragraphing
4. A review of topic sentence formulating
5. A review of reading and telling stories

C. Literature - Liberian Literature

1. A review of Folklore, biographies, autobiographies, essays
2. A review of the short story: Theme, climax, conflict, identifying main characters, resolution of conflict, and setting of a given story
3. A review of whatever drama read
4. A review of figures of speech

Semester Review/Examination

GRADE VIII
ENGLISH - LANGUAGE AND LITERATURE
CONTENT AND/ACTIVITIES-SYLLABUS
FIRST SEMESTER
UNIT I
(SIX WEEKS)

A. Grammar

1. Using parts of speech - Noun, pronoun, adjective, verb, adverb, preposition, conjunction, interjection
2. Studying parts of a sentence - sentence defined, subject and predicate, simple subject, simple predicate
3. Strengthening cocabulary - understanding the use of words, getting meaning from context
4. Forming of words - synonyms, antonyms and the use of dictionary
5. (Using of Library other subject areas)

B. Composition

1. Engaging students in writing effective sentences and paragraphs
2. Developing topic sentence - sticking to the topic sentence
3. Creative writing - plan class booklet
4. Original poems and short stories
5. Talking with people and making introductions, beginning a conversation, interviewing people for information

C. Reading

1. Reading selected pieces of work for speed and appreciation
2. Enlarging vocabulary by reading in many subject areas
3. Reading good prose writing for comprehension

D. Literature - Liberian Literature Study

1. Folklore
2. Biographies
3. The short story: Its defination and characteristics
4. Identifying authors
5. Poetry

6. Recognizing figures of speech: Personification, simile, metaphor
7. Collateral reading reports

UNIT II
(SIX WEEKS)

A. Grammar

1. Placing emphasis on verbs: Tenses and conjugation of verbs
2. Studying parts of a sentence: Compound subject, compound predicate, direct object, indirect object
3. Using nouns and pronouns - forming the singular and plural, forming the cases of pronouns
4. Developing vocabulary - forming of words, homonyms and the use of the dictionary. Reading and studying

B. Composition

1. involving students in logical development of the paragraph
2. Methods of development - sticking to the topic sentence
3. Giving directions, speaking and listening - good voice, poise, planning a talk
4. Writing simple essays

C. Reading

1. Reading selected prose for developing skills in good writing
2. Reading selected poetry two (2) times weekly for appreciation
3. Engaging students in reading activities based on individual interests

D. Literature - Liberian Literature

1. Folklore
2. Strengthening students in writing a critical analysis of authors studied
3. Reading a short story
4. Identifying the theme, climax, conflict and resolution of the conflict of a short story
5. Studying and enjoying poetry
6. Learning and using figures of speech: Metonymy, allegory
7. Collateral reading reports

262

UNIT III

(SIX WEEKS)

A. Grammar

1. Reviewing parts of a sentence - predicate nominative; predicate adjective
2. Using who and whom in sentences
3. Reviewing regular and irregular verbs active and passive verbs
4. Noting agreement of subject and verb

B. Composition

1. Involving students in creative writing
2. Writing reports, notices, notes, and planning the outline
3. Using an outline for writing the report
4. Listening carefully
5. Interpreting parliamentary procedures
6. Holding meeting and practicing parliamentary procedures

C. Reading

Strengthening Vocabulary - fast and slow reading different materials, reading more materials for vocabulary building

D. Literature - Liberian Literature (Review)

1. Folklore
2. Biographies and autobiographies of authors studied
3. The short story: Identifying the theme, climax, conflicts, and resolution
4. Reading a short story
5. Poetry
6. Figures of speech: Antithesis, hyperbole (semester examination)

SECOND SEMESTER

UNIT IV

(SIX WEEKS)

A. Grammar

1. Using who and whom in questions

2. Introducing the phrase - the phrase defined
3. Prepositional, adverb and adjective phrases
4. Reviewing the simple sentence - its definition
5. Expanding use of the dictionary

B. Composition

1. Involving students in writing compositions - essays, business and friendly letters
2. Writing reports
3. Making oral reports, giving short speeches in class

C. Reading

1. Reading good prose and poetry two (2) times weekly for comprehension
2. Selected prose for reading in various subject areas
3. Reading selected works for developing interest in speaking
4. Strengthening vocabulary - assigning a list of new words, reading difficult materials

D. Literature - Liberian Literature

1. Studying Drama - a Liberian or an African play
2. Studying the short story
3. Identifying five (5) kinds of conflicts in short story
4. Understanding and appreciating poetry
5. Engaging students in studying essays, biographies and autobiographies
6. Studying figures of speech: Irony, onomatopoeia
7. Collateral reading reports

UNIT V
(SIX WEEKS)

A. Grammar

1. Using pronouns and their antecedents
2. Using modifiers - adjective and adverbs
3. Adjectives and adverbs in comparison
4. Forming simple, compound, and complex sentences
5. Using punctuation effectively in sentences

6. Strengthening vocabulary
7. Expanding use of the dictionary
8. Assigning a list of words

B. Composition

1. Engaging students in writing business and social letters
2. Involving students in writing essays and reports
3. Strengthening students' skill in creative writing
4. Writing to convince and persuade
5. Making clear and effective persuasive opinions

C. Reading

1. Reading continuously in various subject areas for appreciation, skills and comprehension

D. Literature - Liberian Literature

1. Studying poetry
2. Studying drama - A Liberian or an African play
3. Studying and rehearsing a play
4. Collateral reading reports

UNIT VI
(SIX WEEKS)

A. Grammar

1. Reviewing who and whom in clauses
2. Reviewing the simple, compound and complex sentences
3. Reviewing pronouns and modifiers
4. Reviewing punctuation and vocabulary development

B. Composition

1. Reviewing essays, business and friendly letters
2. Reviewing reports and speeches

C. Reading

Reading for speed and comprehension

D. Literature - Liberian Literature

1. Reviewing drama, folklore and the short story
2. Poetry

3. Writing biographies and autobiographies
4. Producing plays
5. Finalizing class booklet

GRADE IX

ENGLISH - LANGUAGE AND LITERATURE

CONTENT: ACTIVITIES-SYLLABUS

FIRST SEMESTER

UNIT I

(SIX WEEKS)

A. Grammar

Capitalization and punctuation

1. Reviewing rules
2. Practice in writing sentences
3. Use of punctuation in paragraph writing
4. Practice exercises in use of capitals, commas and end marks, colons, semi-colons, quotation marks, apostrophes ahd hyphens

B. Composition

1. Writing paragraphs-identifying topic sentence, cohesion
2. Writing multi-paragraph papers dealing with experiences, sciences, social studies, literature etc.
3. Engaging in creative writing
4. Writing letters - friendly, business, invitations
5. Book reports-collateral reading
6. Making oral reports

C. Reading

1. Engaging students in reading activities for vocabulary growth
2. Reading for speed and comprehension
3. Reading selected prose two times weekly for appreciation

D. Literature

1. A study of Liberian authors and their works, prose, short story, poetry, novel, play
2. Identifying folklore

3. A study of the short story and its elements

   setting
   character
   plot and conflict
   climax and theme

4. Making book reports - 10 minute reports and required reading, writing of essays on their setting, plot, character development, conflict, climax and theme

UNIT II

(SIX WEEKS)

A. Grammar

Study of parts of speech
Identifying parts of speech and usage in sentences

1. Verbs, tenses, principal parts, action verbs, verb "To be," Verb phrases, verb usage
2. Nouns: Subjects in sentences, predicate nominative, direct object, use with transitive and intransitive verbs

B. Composition

1. Making book reports
   Writing fiction
   Biography
   Sciences
   Social studies

2. Writing Verse
   Rhythm
   Limerick
   Couplet
   Quatrain

3. Writing letters of application

C. Reading

1. Selected reading two times weekly for comprehension
2. Selected reading for vocabulary development
3. Reading for speech two times weekly

D. Literature

1. Studying Liberian and African authors
   Understanding and appreciating folklore ,
   Liberia, Sierra Leone, Ivory Coast, Ghana
2. Reading biography of W.V.S. Tubman
   Living authors
3. Poetry study
4. Studying Liberian general literature (textbook)

UNIT III

(SIX WEEKS)

A. Grammar

1. Parts of speech-review all in practical exercises
2. Diagraming sentences
3. Developing library skills
   The card catalogue
   Arrangement of books on shelves
4. Study skills
   Note taking (various subject areas)
   Outlining (basic to writing reports and stories)

B. Composition - Oral and Written

1. Reading for main ideas and retention
2. Writing reports on reading
3. Writing poetry and plays
4. Rehearsal and producing one play written by class
5. Creative writing: poetry, prose
6. Writing for school paper

C. Literature Study

1. Reviewing literature of units I and II
2. Completion of first half of Liberian Literature Grade 9
3. Collateral reading
4. Shape and sound of poems

   Significance of language usage
   Images and figures of speech

First Semester Examination

SECOND SEMESTER

UNIT IV

(SIX WEEKS)

A. Grammar

1. Review nouns (in sentences)
   a. Appositives, nouns of address, and objects
   b. Locating indirect objects

        - c. Building sentences with gerunds and infinitives
        - d. Agreement of verb and noun subjects exercises
    - 2. Review pronouns
        - a. Identifying cases
        - b. Correct usage of who and whom in exercises
        - c. Demonstrative pronouns practice
        - d. Subject-verb agreement exercises
    - 3. Developing library skills

- B. Composition
    - 1. Creative writing
    - 2. Descriptive writing
        - a. Objects, places and persons
        - b. Arranging details
        - c. Describing pictures as positives, negative or neutral
        - d. Describing emotion using similes and metaphors
    - 3. Developing narrative writing skills
        - a. Describing time, place and mood from pictures
        - b. Characterization
        - c. Writing narrative dialogue
        - d. Oral reports and debates

- C. Reading
    - 1. Reading selected prose for developing skills in pronunciation
    - 2. Enlarging vocabulary through reading
    - 3. Reading selected prose for developing taste

- D. Literature
    - 1. Reading in second half of Liberian Literature Grade 9
    - 2. Poetry study
    - 3. Collateral Reading reports

UNIT V

(SIX WEEKS)

- A. Grammar
    - 1. Review parts of speech-usages

- a. Adjectives: Use and selection of one word adjectives comparing adjectives, participles and infinitives and adjectives prepositional phrases and adjective modifiers
- b. Adverbs, one word adverbs, comparing adverbs, infinitives as adverbs

2. Study simple, compound and complex sentences:
    - a. Recognizing dependent clause and adjective
    - b. Recognizing dependent clause as adverb
    - c. Recognizing dependent clause as noun
    - d. Distinguishing between phrases and clauses
3. Reviewing kinds of sentences

B. Composition

1. Writing for various subject areas: science, social studies
2. Research paper planning and outlining
    - a. Selecting topic, making outline
    - b. Using library and resource persons
    - c. Making first draft after one month's research
    - d. Final draft after six weeks
3. Writing essays on social problems
4. Planning and executing a seminar
5. Creative writing

C. Reading

1. Reading selected poetry and prose for appreciation
2. Developing vocabulary through readings in all subject areas based on individual interests
3. Reading for comprehension and speed

D. Literature study

1. Liberian literature (3rd quarter textbook)
2. Reading a modern novel
3. Reading a biography of an African
4. Autobiography
5. Poetry

SECONDARY SCHOOL MATHEMATICS CURRICULUM

MINISTRY OF EDUCATION

Republic of Liberia
1980

L OF A MATHEMATICS PROGRAM FOR THE JUNIOR HIGH SCHOOLS OF LIBERIA

It is well known that a sizeable number of our students terminate their education at the end of the ninth grade. Of those who complete high [illegible] 5% [illegible]; the rest find employment [illegible]. Our mathematics program should therefore be directed towards the [illegible] groups:

1. Those who terminate their formal education at the end of the Junior High School.

2. Those who go on to senior high school but terminate their formal education at the end of grade 12.

3. Those who go on to college.

For the first group, the junior high school student, the mathematics should seek to perform two basic functions:

a) To give the students a broad view of the field of elementary mathematics in order to explore their abilities; to lay the foundation of basic information essential for later pursuit of individual interests and aptitudes. Such a program would equip the students with the tools necessary for further work in mathematics in the senior high school.

b) To give the students the mathematical information and skills most likely to be useful to them in their vocational pursuits in the civil service as well as in private industry.

BEST COPY AVAILABLE

[illegible]

I. [illegible] in the Junior High [illegible]

1. To extend the student's understanding [illegible] of arithmetic.
2. To extend the student's power of perception [illegible] independently.
3. To extend the student's basic understanding of the [illegible] organization of the number system.
4. To extend the student's proficiency in computation.
5. To broaden the student's ability to think and calcul[illegible]
6. To broaden the student's ability to relate abstrac[illegible] to number operation.
7. To build for the individual an understanding of, and [illegible] mathematics essential for living amid the many deman[illegible]
8. To equip the student with kind of arithmetical knowl[illegible] enable him to solve his daily life problems.

II. Algebra in the Junior High Schools:

1. To generalize concepts and principles learned [illegible] appreciation of [illegible]
2. To [illegible] an understand[illegible] [illegible] significance of algebra.
3. To give the student a [illegible] problems in mathematics and related areas.
4. To introduce basic concepts [illegible] pursuit of individual interest and apt[illegible]
5. To deepen the arithmetical knowledge of the [illegible] sufficient aid in all fields of commercial enterpr[illegible] may be exposed to if their courses are terminated [illegible] of the junior high school.

BEST COPY AVAILABLE

II. Geometry in the Junior High Schools:

The world around us abounds in geometric forms. The villager uses geometric principles to build his hut. The roofs of some of these huts are conical in shape; others are dihedral angles. Other examples exist, but whatever geometric information is gained in these settings, it is mainly incidental. The objectives of geometrical instruction in the junior high school therefore should be:

1. To help the student acquire information about geometric figures in the plane and in space.
2. To help the student learn to clarify, organize, and extend his understanding of geometrical concepts and relationships.
3. To help the student apply principles of geometry to solve real life problems.
4. To provide the student with the opportunity for original and creative thinking.
5. To help the student appreciate the relationship among geometric forms in his environment.

The approach in the attainment of these objectives is mainly informal, where understanding rather than formal proofs, is the central theme. Also, it is hoped that the course will draw heavily upon intuition, experimentation, and clear thinking in working towards these objectives.

Probability & Statistics in the Junior High Schools:

1. To provide students with the experience in collecting, organizing and interpreting data by use of simple statistical graphs and ungrouped data.
2. To introduce students to the concepts of probability measure through games of chance.

Trigonometry in the Junior High Schools:

1. To extend the student's concept of ratio through the use of numerical trigonometry.
2. To carry on individual measurement through the use of right triangles and given trigonometric ratios.(sine, cosine and tangent).
3. To provide opportunities for experimental activities in numerical trigonometry.

SCOPE AND SEQUENCE

SEVENTH GRADE

I. ARITHMETIC SKILLS

PLACE VALUE

Number and Numeral

Reading and Writing large numbers (from hundred to hundreds of billions)

Writing numbers in expanded notation form (from hundred to hundreds of billions)

Number Base

(a) Conversion from base ten to bases 3 to eight
(b) Adding and subtracting bases 3 to eight

OPERATIONS

Addition and Subtraction (2-5 digits)

Symbol of Grouping (parenthese only)

Properties

(a) Commutative

(b) Associative

(c) Zero

Multiplication and Division (1-3 digits) numbers

Properties

(a) Distributive

(b) One

Word problems

NUMBER THEORY

Even and Odd numbers

Factors and Factoring

Prime factorization (1 - 4 digits)

Exponents

Finding LCM, GCD and LCD of numbers

Prime and Composite numbers

BEST COPY AVAILABLE

Using the Sieve of Eratosthenese to determine the prime numbers between one and one hundred.

Divisibility rules for 2, 3, 5 and 9

Squaring numbers

Finding square roots of numbers (1 to 3 digits numbers)

RACTIONS AND DECIMALS

Review Equivalent fractions

Review Adding and Subtracting fractions with like denominators

Adding fractions unlike denominators

Subtracting fractions unlike denominators

Adding and Subtracting mixed fractions

Multiplication

(a) fractions and mixed fractions

Division

(a) Reciprocals
(b) fractions and mixed fractions

Properties

Finding averages

IMALS

(a) Addition
(b) Subtraction
(c) Multiplication
(d) Division
(e) Coversion from decimal to fraction
(f) Conversion from fraction to decimal
(g) Clock arithmetic

BEST COPY AVAILABLE

PER CENTS

Meaning of per cent and writing numbers as percents

Finding percent of whole numbers

Percentages Problems
- (a) Simple interest
- (b) Commission
- (c) Discount
- (d) Profit and Loss

Ratio and Proportion

Scale Drawing

MENSURATION

System of measurements:
- (a) Metric
- (b) English

Lengths areas and volumes of plane and solid figures

Pythagoras theorem

OPTIONAL

SETS

Concept of Set

Elements or members of a set

Kinds of sets

Matching sets

Union and Intersection of sets

II. GEOMETRIC CONCEPTS

Simple geometric figures and Symbols
- (a) Point
- (b) Line
- (c) Line Segment
- (d) Rays
- (e) Angles - kinds

BEST COPY AVAILABLE

Constructions

(a) Line Segments

(b) Bisecting line segments

Polygons - kinds of polygons

(a) Three-sided

Triangles According to sides and angles.

(b) Four-sided

Rectangle

Square

Trapezoid

Parallelogram

Rhombus

Perimeters and Area (see figures above)

OPTIONAL

Coordinate Geometry
    The integral number line
    Coordinate of a point
    Graph of open sentence in one variable

Motions in the plane
    point symmetry, line symmetry
    Reflections in the plane

Space Figures.
    Properties, models, and sketches of planes, prisms, cylinder, cone, pyramid, sphere.
    Surface area and volume

Venn Diagrams of polygons and their subsets.

III. ALGEBRAIC CONCEPTS

1. Integers - positive and negative
   Representative on number line
2. Adding and Subtracting integers-positive and negative
3. Multiplying and Dividing "-" & "+" nos
4. Basic Algebraic Expressions
5. Evaluation of Algebraic expressions and formula
6. Linear open Sentences in one valuable

BEST COPY AVAILABLE

SEVENTH GRADE UNIT CONTENTS/ACTIVITIES

ARITHMETIC SKILLS

UNIT I: OPERATIONS

Section I. Idea of number and numeral. Reading and writing large numbers. Square and square root. Symbols of grouping. Clock or modular arithmetic.

Section II. BASIC OPERATIONS

Addition, Subtraction, Multiplication and Division of whole and rational numbers. Interest, Commission, Percentages, Discount, Profit and Loss, Ratio and Proportion L.C.M./G.C.F.

OBJECTIVES:

The student will be able to:

1. Read and write large numbers (9-digit nos.)
2. Write numerals in other bases (2,3, and 4) in the expanded notation.
3. Square and find the square root of a given number.
4. Simplify expressions involving parentheses.
5. Add, and subtract in bases other than ten.
6. Add, subtract, multiply and divide whole, decimal and rational numbers.
7. Find LCM and GCF of two or more numbers.
8. Do clock or modular arithmetic.
9. Solve problems involving ratio and proportion.
10. Solve problems involving percentages.
11. Solve simple and compound interest.
12. Solve problems involving discount profit and loss, and commission
13. Use the commutative, Associative and distributive properties in operations.

MAJOR CONEPTS/IDEAS TO BE DEVELOPED

Numeral, Square, Square root, Modular Arithemetic, Ratio and Proportion, Grouping, Interest, Commission, Percentage, Discount, Profit and Loss, GCF, number line.

BEST COPY AVAILABLE

STRUCTIONAL MATERIALS

Numeral cards, Number line Charts, Clock board, Geoboard.

TIVITIES:

1. Differentiating between numbers and numerals
2. Reading and writing large numberals in words and figures.
3. Performing operations using bases other than ten.
4. Squaring and finding the square root of a given number.
5. Simpliying expression involving symbols of grouping.
6. Doing clock or modular arithmetic.
7. Finding the Ratio of two given numbers.
8. Finding simple and compound interest on a given loan.
9. Finding commission on a given sale.
10. Finding what percent one number is of another.
11. Solving problems involving interest, rate, time and principal.
12. Adding and subtracting, using the number line.
13. Changing base ten to 3 and eight.
14. Adding and Subtracting in other bases.

IT II. NUMBER THEORY

Factors and factoring; Exponent or power; Prime Number; Composite Number; Even and Odd Numbers; Divisibility rules; Comparing Fractions; the sieve of Eratosthenes; Prime Factorization. Averages.

JECTIVES:

The student will be able to:

1. Find the factors of a given number.
2. Use exponents or powers in factoring.
3. Differentiate between even and Odd numbers.
4. Differentiate between Prime and Composite numbers.
5. Apply divisibility rules when dividing one number by another.
6. Compare fractions with various denominators.
7. Use the Sieve of Eratosthenes to determine prime numbers between one and one hundred.
8. Find averages

BEST COPY AVAILABLE

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Factors, Exponents, Prime Number; Composite Number; Sieve of Eratosthenes, Prime Factorization. Averages

ACTIVITIES:

1. Developing the ideas of factors, exponent and factoring. .
2. Finding prime factorization of a given number.
3. Giving examples of prime and composite numbers; even and odd numbers.
4. Using divisibility rules to see if 2,3,4,5,6 etc. can divide a given number.
5. Giving two or more fractional numbers to see which one is gre or greatest.
6. Using the Sieve of Eratosthenes to find the prime numbers bet one and one hundred.
7. Finding averages.

NIT III. MENSURATION

System of measurements:

a. Metric

b. English (Imperial)

JECTIVES:

The student will be able to:

1. Add and subtract using both the Metric and English units of measurements
2. Multiply and divde using both the Metric and English units of Measurements
3. Find lengths, Areas and volumes of plane and solid figures using metric and English units.
4. Convert from one unit of measure to and another.
5. Apply the Pythagoras theorem in problem solving.

AJOR CONCEPTS/IDEAS TO BE DEVELOPED

Measurements, metric units, (Imperial) English units.
Pythagoras Theorem.

TIVITIES:

1. Adding and subtracting using the metric and English units of measure.
2. Multiplying and dividing using the metric and English units of units of measurements
3. Finding lengths, areas and volumes of plane and solid figure using both Metric and English units.
4. Converting from one unit to another.
5. Applying the Pythagoras theorem in calculating sides of a right angled triangle.

UNIT IV. SET

Idea of a set; set notation; member of a set
Set description. Kinds of sets. Subsets of a
given set. Union and Intersection. Venn Diagrams,
Matching sets.

OBJECTIVES:

The student will be able to:

1. Name the elements of a given set.
2. Name the kinds of sets with examples.
3. Find the Union and Intersection of two given sets by listing and by Venn Diagrams.
4. Find subsets of a given set.
5. Match the elements of two given sets.
6. Describe a given set.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Set, unit set, empty set, equal sets, equivalent sets, subsets, disjoint sets, Finite and infinite sets, Intersection and union, One-to-One Matching.

INSTRUCTIONAL MATERIALS

Rope, bottle tops, rubber bands, small rocks, paper cut-outs.

ACTIVITIES:

1. Developed idea of set, using examples.
2. Naming the elements of a given set.
3. Describing sets by listing and by a rule or condition.
4. Identifying the different kinds of sets by giving examples.
5. Finding the number of subsets of a given set.
6. Matching the elements of two finite sets.
7. Finding the union and intersection of two finite sets.

GEOMETRIC CONCEPTS

UNIT I: BASIC FIGURES OF GEOMETRY

Section I: Elementary geometry concepts
Points, lines, and surfaces
Segments, rays, symbolization of an angle.
Rays and angles; symbolization of an angle.
Exterior and interior of an angle. Intersection of lines; union and intersection of segments, union and intersection of rays. Parallel lines.

Section II: Construction, and segment and angle measure.
Compass and straight edge. Construction of congruent segments; congruent angles; circules, Concept of congruence of angles and segements. The Protractor; angle measure. Using the protractor to draw different angles. Right, acte, obtuse, and straight angles.
Angle relationships - complementary angles; supplementary angles; vertical angles, adjacent angles.

OBJECTIVES:

The student will be able to:

1. Distinguish among point, line segment, ray, and their symbolization.
2. Determine the union and intersection of sets of points (e.g. of lines,segments, etc.).
3. Decide when a set of points represents an angle.
4. Use three letters to name an angle.
5. Indicate the interior and exterior of a given angle.
6. Differentiate between parallel and non-parallel lines.
7. Construct:
   a. A segment congruent to a given segment.
   b. an angle congruent to a given angle.
   c. a circle with a given radius.
8. Determine the measure of a given angle, using the protractor, and draw given angles with the protractor.
9. Use the concepts of is greater than, etc. to compare two segments or two angles.
10. Classify given angles as acute, right or obtuse; straight angles, etc.
11. Identify angles as adjacent or vertical.

Section I· MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Point; line; plane; segment; ray; union and intersection of sets of points; angle; interior and exterior of an angle; parallelism and skewness. Congruence.

INSTRUCTIONAL MATERIALS:

Short lengths of bamboos; strings; match sticks, stiff papers; cha chalkboard ruler; pencil and ruler.

MAJOR ACTIVITIES :

1. Using models in class to represent points, lines,segments and planes. Using other exmples like match sticks, lengths of bamb to represent segments; walls of the room to represent planes.
2. Using chalkboard exercises to name different lines, segments, rays, drawn on the board.
3. Naming the union and intersection of sets of points (example union of a ray and segment; intersection of two adjacent walls to) show a line segment.
4. Identifying angles in sets of figures drawn on the board.
5. Naming an angle by three letters; by the vertex letter, by a numeral.
6. Indicating the interior and exterior of angles.
7. Naming models of line segments that seem parallel, and those that intersect.

UNIT I.

Section II:

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Congruence of segments; congruence of angles, circle, radius, diam circumference. Angle measure, acute; right; obtuse angles, vertic angles. Complementary and supplementary angles.

INSTRUCTIONAL MATERIALS

Compass, straight edge, protractor, ruler; string; chalkboard comp

Section II:

BEST COPY AVAILABLE

MAJOR ACTIVITIES

1. Using the compass and straight edge to construct congruent segments and congruent angles.
2. Using the compass (or a string) to draw circles with different radii; naming circular objects.
3. Using the protractor to draw angles of given measures.
4. Estimating the degree measures of given angles and verifying by using the protractor.
5. Recognizing and naming angles as acute, right, obtuse (through measurement).
6. Identifying (through measurement) angles that are congruent when two straight lines intersect.
7. Identifying adjacent angles and vertical angles.
8. Identifying complementary angles and supplementary angles in a figure.
9. Giving the complement and/or the supplement of a given angle.
10. Finding the sum or difference of two angles, numerically.

NIT II.

MPLE POLYGONS:

Concept of a polygon. Interior and exterior of a polygon. Vertices and diagonals of a polygon. Classification of polygons according to number of sides. Sketches and cardboard models of simple polygons. Triangles. Parts of triangle. Classification of triangles according to sides and angles. Sum of angles of a quadrilateral. Construction of triangles by SSS and SAS. Perimeter and area of square, rectangle, parallelogram, triangle; trapezoid. Right triangles - hypotenuse; Pythagorean rule, Applications.

BJECTIVES:

The student will be able to:

1. Determine whether or not a given closed curve is a polygon.
2. Classify a polygon according to number of sides.
3. Draw sketches and make cardboard models of simple closed curves (e.g. triangle, quadrilateral, pentagon, etc.).
4. Classify a triangle according to its sides and angles.
5. Make conjectures concerning the angle sum of a triangle, a quadrilateral.
6. Construct a triangle by SSS and SAS.
7. Tell the difference between perimeter and area.

BEST COPY AVAILABLE

8. Determine the perimeter and area of the following simple closed curves:

   Square, rectangle, parallelogram, triangle, trapezoid, circle by counting and by formula.

9. Use the theorem of Pythagoras to solve numerical problems.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Polygon; kinds of polygons; diagonal of a polygon; kinds of triangles; naming of triangles; sum of angles of a triangle. In a triangle, the largest angle lies opposite the longest side, and vice versa; perimeter, area, Pythagoras' relation.

INSTRUCTIONAL MATERIALS

Cardboard models of polygons; poster paper for cutting out polygons; scissors. Pencils and ruler, chalkboard and chalk; graph paper; dot paper; geoboard.

MAJOR ACTIVITIES:

1. Identifying simple polygons from sets of simple closed curve drawn on the board.
2. (a) Classifying a polygon (using the prefixes tri-, quadri-, penta-, etc.) when the number of sides is given; (b) classifying a polygon as convex or concave.
3. Classifying a polygon when the vertices are given. (e.g. a polygon with vertices A, B, C, D, E, which is a pentagon).
4. Drawing a polygon when its vertices are given, or when the number of sides is given.
5. Naming consecutive vertices of given polygons.
6. Identifying and drawing the diagonals of a polygon.
7. Making cardboard models of given polygons.
8. Classifying a triangle according to sides and angles.
9. Naming a triangle with vertices A, B, and C in six different ways.
10. Performing experiments to determine the angle sum of a triangle, quadrilateral and other given polygons.
11. Constructing a triangle when the three sides are given, and when two sides and the included angle are given.
12. Performing experiments with different triangles to find a relation between the sides and the size of the angles opposite those sides. (the largest angle lies opposite the longest side, and vice versa).

BEST COPY AVAILABLE

13. Using the ruler to find the perimeters of different polygons.

14. Finding the areas of different simple closed curves drawn on the coordinate grid (or on the geoboard), by counting squares.

15. Calculating the perimeters and areas of squares, rectangles, parallelograms, triangles, trapezoids and circles, using formulas.

16. Using the relation $a^2+b^2 = c^2$ for a right triangle to find the length of one side when the lengths of two sides are given. (where c represents the length of the hypothenuse, and a and b represent the lengths of the legs).

III. Optional

NUMBER LINE:

Number line; origin
The integral number line; the rational number line. Coordinate of a point. Graph of number. Graph of a set of numbers. Graph of solution set of an open sentence.

OBJECTIVES:

The student will be able to:

1. Draw a number line and plot given numbers on it.
2. Find the number that belong to indicated points on a number line.
3. Graph a set of numbers.
4. Estimate the numbers that match specified points on a number line.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Number line, graph of a number, coordinate of a point, estimation of length.

INSTRUCTIONAL MATERIALS

Markers for drawing number lines, Chalkboard ruler.

BEST COPY AVAILABLE

MAJOR ACTIVITIES:

1. Drawing number lines, both integral and rational.
2. Graphing given numbers on the number line.
3. Naming the coordinates of different points on the number line.
4. Graphing sets of numbers.
5. Estimating the numbers that belong to specified points on the number line.

UNIT IV: MOTION GEOMETRY

Section I SYMMETRY:

Concept of symmetry (or "balance") point symmetry; line symmetry; a of symmetry. Examples of symmetry with respect to a line or a poin Sketches of symmetric figures.

Section II. REFLECTION:

Concept of reflection; examples of reflections. Image. Mirror refl. Reflection image with respect to a line.

UNIT IV. MOTION GEOMETRY: SYMMETRY AND REFLECTION

OBJECTIVES:

The student will be able to:

1. Tell whether a given plane figure posssesses symmetry with resp to a point or line.
2. Tell how many axes of symmetry, if any can be drawn in a given figure (and draw them).
3. Name, from nature, examples of symmetry with respect to a line.
4. Name from man-made designs examples of symmetry with respect t line.
5. Sketch plane figures that have lines of symmetry.
6. Draw the reflected image of a plane figure, using a mirror.
7. Draw the reflected image of a plane figure with respect to a li
8. Find a reflected image of a plane geometric figure (point, line, angle, etc.) by paper folding.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Symmetry (or "Balance"); symmetry with respect to a line or point; Reflection, Image.

CTIONAL MATERIALS

Graph paper; dot paper; geoboard; plain sheets of paper; scissors; ink, mirrors; pencil and rulers.

ACTIVITIES:

tion I. SYMMETRY

1. Naming some figures or designs that have point symmetry or line symmetry.
2. Drawing a circle and some of its diameters to illustrate point symmetry.
3. Using isosoceles triangles, equilateral triangles, and squares to show line symmetry. (by folding the triangle along the median and the squares along a diagonal).
4. Using paper folding to illustrate both types of symmetry.
5. Putting a blot of ink on a sheet of paper, folding and creasing the paper, then unfolding it to illustrate symmetry with respect to a line.

tion II. REFLECTION

1. Naming examples of reflections (example: The reflection of a tree in a river).
2. Holding a plane geometric figure in front of a mirror to observe the reflection of the figure.
3. Drawing the reflection image from (2), above.
4. Drawing the reflected image of a plane figure with respect to a line.

SPACE FIGURES

tion I. Properties and models of: cube, rectangular prism, triangular prism, triangular and square pyramids; cone; sphere cylinder.

tion II. Sketches of the solids listed in Section I.

tion III. Volumes and surface area of solids. Concept of volume. Volume of: cube, rectangular prism; triangular prism; pyramid cone, cylinder, sphere.

ECTIVES:

The student will be able to:

1. State the properties and make models of the following space figures. cube, rectangular solid (cuboid), cylinder, cone, sphere.
2. Make sketches of the figures listed in Objective [illegible].
3. Determine the surface area and volume of each space figure in Objective 1, give the appropriate dimensions.

BEST COPY AVAILABLE

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Space figure, volume

INSTRUCTIONAL MATERIALS

Toy cube; bricks, tin cans; paper models of solids; globe; cut-ou of patterns; pencils and rulers; empty chalk box; matchbox

MAJOR ACTIVITIES:

1. Describing the solids collected, and using cutouts of patterns make models of solid figures.
2. Making sketches of the space figures collected.
3. Finding the volume of solids by counting unit cubes.
4. Using the appropriate formulas to compute the volumes of the different solids, using measurements taken.
5. Finding the surface area of some of the solids, for example, c rectangular solid, and prism; comparing the surface area with volume in each case.

BEST COPY AVAILABLE

ALGEBRAIC CONCEPTS

UNIT I. OPERATIONS

Whole numbers, Integers, Fractions,
Algebraic expressions and formulae

OBJECTIVES:

The student will be able to:

1. Add and subtract whole numbers, Integers, Fractions.
2. Multiply and divide whole numbers, integers, Fractions.
3. Evaluate algebraic expressions and formulae.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Integer, Fraction, Algebraic expression
Evaluation, formula.

ACTIVITIES:

1. Adding and subtracting whole numbers, integers, fractions.
2. Multiplying and dividing whole numbers, integers, fractions.
3. Evaluating simple algebraic expressions and formulas.

UNIT II. OPEN SENTENCES

Solution set, replacement set (domain);
Graph, Variable

OBJECTIVES:

The student will be able to:

1. Find the solution set of an open sentence.
2. Find the replacement set of an open sentence.
3. Solve an open sentence with one variable.
4. Graph the solution set of an open sentence on the number line.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Replacement Set; Variable, Graph, Order

ACTIVITIES:

Finding solution set of an open sentence.
Finding replacement set of an open sentence.
Solving an open sentence with one variable.
Graphing the solution set of an open sentence on the number line.
Solving open sentences in one variable involving age and coins problems.

BEST COPY AVAILABLE

SCOPE AND SEQUENCE

EIGHTH GRADE

I. ARITHMETIC SKILLS

OPERATIONS:

Reading large numbers
(from three place - thousand up to hundred of trillions).

Writing large numbers
(from thousand up to hundred of trillions).

Number Bases
(base two to base nine - convasion)
a. Addition Base two to base nine
b. Subtraction Base two to base nine

Addition of whole numbers (2 to 6 digits)

Subtraction of whole numbers (2 to 6 digits)

Multiplication of whole numbers
(2 to 4 place multiplicands and 2 to 3 place multipliers

Division
(2 to 3 place divisions and 2 to 5 place dividends)

Finding Averages

Word Problems

NUMBER THEORY

Factors and Factoring (two to three place numbers)

Unique factorization theorem

Finding square roots of numbers
(2 to 4 place numbers)

Cubing numbers

Finding cube roots of numbers
(1 to 3 place numbers)

Exponents

Finding LCM, GCD and LCD of numbers
(Review the divisibility rules for 2, 3, 5, and 9)

Rational Numbers

1. Fractions
    - a) Addition
    - b) Subtraction
    - c) Multiplication
    - d) Division
      (use the idea of reciprocal)

2. Decimals
    - a) Addition and Subtraction
    - b) Multiplication and Division

    Ratio and Proportion

    Percentage Problems
    - a) converting fractions to decimal
    - b) " decimal to fractions
    - c) converting decimals and fractions to percents
    - d) finding fractional parts of numbers
    - e) finding percent of numbers
    - f) simple and compound interests
    - g) discounts
    - h) commissions
    - i) profit and loss
    - j) partnership

System of measurements
- a) English
    - Length
    - Weight
    - Area
    - Volume
- b) Metric
    - Length
    - Weight
    - Area
    - Volume

Areas and Volume of plane and solid figures

II. Geometric concepts

Review work

points, line, half line, line segments planes (properties review carefully)

Collinear points and Coplanar points

Angles -

a) Review the kinds of angles
(acute, right, obtuse, reflex, straight)

New concepts of Angles

a) Vertical angles

b) Adjacent angles

c) Complementary angles

d) Supplementary angles

Simple Polygons and their properties

a) Three-sided (triangles by angles and length or sides)

b) Four-sided (Quadrilaterals. square, rectrangle, rhombus trapezoids, parallelograms)

c) Others (Name up to eight-sided figures

The sum of the angles of triangles .

Sum of interior angles of polygons

S=(n-2)180 derive intuiatively

Perimeters and Areas of polygonal regions

Pythagoras' Theorem - Applications

Constructions

Review bisecting of line segments

Bisecting Angles

Constructing angles

Constructing triangles

a) By SSS

b) " SAS

c) " ASA

d) Parallel lines

Scale drawing and choice of correct scale

NAL, COORDINATE GEOMETRY

The rational number line
Length of a directed segment, absolute value
Midpoint of a segment on a number axis ($M=\frac{x_1 + x_2}{2}$; formula derived initiutively.

e drawing, and choice of correct scale

ns in the plane

- Revision and extension of concept of symmetry.
- Reflections
- Rotations
- Translations

e Figures

- Review of:
  - Properties, models, and sketches of planes
  - Prisms, cylinders, cone, pyramid, sphere.
  - Area and volume
  - Magic Squares
  - Applications of Venn Diagrams

. Algebraic Concepts

- Operations and properties of operations
- Order of operations
- Symbols of grouping
- Evaluation of Algebraic Expressions
- Linear open sentences in one variable
- Relations and functions.
- Combining like terms
- Story problems - coins, geometry age numbers etc.
- Exponents

7. PROBABILITY AND STATISTICS CONCEPTS

Construction, reading and interpretation of the following: pictographs, bar graphs, line graph and circle graphs.

Concept of probability and probability values using P(E) through games of chance.

UNIT CONTENTS/ACTIVITIES

EIGHTH GRADE

ARITHMETICS SKILLS OPERATIONS

Whole Numbers

OBJECTIVES:

The student will be able to:

1. Read and write large numbers.
2. Add and subtract large numbers.
3. Multiply and divide large numbers.
4. Differentiate between whole and fractional numbers.
5. Add and subtract, using Modular Arithmetic.
6. Operate on other bases

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Whole number, fractional number, Modular Arithmetic.

MAJOR ACTIVITIES:

1. Reading and writing whole numbers with five, six or seven digits
2. Adding and subtracting large whole numbers.
3. Multiplying and dividing large numbers.
4. Differentiating between whole and fractional numbers.
5. Adding and subtracting whole numbers, using Modular Arithmetic.
6. Operating in other bases.

UNIT II. Number Theory

Even and Odd numbers
Prime numbers
Factor; Exponents
Cube Roots
Divisibility rules
Perfect numbers.

ES:

ne student will be able to:

- Differentiate between even and odd numbers.
- Find the prime numbers between one and one hundred using the Sieve of matosthenes.
- Find the common factor of two or more numbers using exponents and set theory.
- Find cube roots, using exponents.
- Use divisibility rules in dividing one number by another.
- Select from a set of numbers those numbers that are perfect.

NCEPTS/IDEAS TO BE DEVELOPED

ven and Odd numbers, Prime number, Exponent, Factor, Perfect number visibility, cube roots.

IVITIES:

ving example of even and odd numbers.

- Finding common factors of two or more numbers by factoring and set theory.
- Finding the square and square roots of a given number.
- Finding the cubes and cube roots of a given number.
- Using exponents in finding the LCM, GCD, and LCD of two or more numbers.
- Using the Sieve of Eratosthenes to write the prime numbers between one and one hundred.
- Selecting Prime numbers from a set of given numbers.
- Selecting from a set of dots, those sets that represent triangular numbers.
- Using the divisibility rules to see if a given number is divisible by 3, 4, 6, 7, 8, 9, 11, etc.
- Using the Pythagrean Theorem to determine the sides of right angled triangle.
- Give a set of triples to determine which sets represent the sides of right angled triangles.

Square and Square Roots

:

student will be able to:

Square a given number

Square mentally a two-digit number ending in five.

Find the square roots of perfect square numbers.

Find the square roots of numbers that are not perfect square numbers.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Square, Square Root.

MAJOR ACTIVITIES:

1. Squaring a given two or more digit number.
2. Squaring mentally a given two digit number ending in
3. Finding the square roots of two or more digits non-perfec square numbers.
4. Finding the square roots of two or more digits perfect s numbers.

Unit III. RATIONAL NUMBERS

Section I. Fractions and Decimals

OBJECTIVES:

The student will be able to:

1. Differentiate between fractional and decimal numbers.
2. Add and subtract fractional numbers.
3. Add and subtract decimal numbers.
4. Multiply and divide fractional numbers.
5. Multiply and divide decimal numbers.
6. Differentiate between rational and irrational numbers.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Fraction, decimal, rational and irrational numbers.

MAJOR ACTIVITIES:

1. Differentiating between fractions and decimals.
2. Adding and subtracting fractions, using the number line, geometric figures (circules, rectangles, etc.)
3. Adding and subtracting decimals.
4. Reducing fractions to decimals.
5. Reducing decimals to fractions.
6. Multiplying and dividing fractions by computation and by usi the number line.
7. Multiplying and dividing decimals.
8. Listing examples of rational and irrational numbers.

II. Ratio and Proportion

CTIVES:

The student will be able to:

1. Differentiate between ratio and proportion.
2. Use ratio and proportion in solving problems,

R CONCEPTS/IDEAS TO BE DEVELOPED

Ratio, Proportion.

R ACTIVITIES:

1. Finding the ratio of two numbers.
2. Giving examples of ratios and proportions.
3. Using ratio and proportion in solving problems

tion III. Percent

Interest, commission, discount, profit and loss.

IVES:

The student will be able to:

1. Do exercises involving the three types of percent problems.
2. Find simple interests on specified amounts.
3. Find compound interest on a given amount
4. Find commission on a certain amount
5. Find discount, profit, and loss on a given amount of money.

OR CONCEPTS/IDEAS TO BE DEVELOPED

Profit and loss, discount, commission, interest.

ACTIVITIES:

1. Finding what percent one number is of another.
2. Finding the profit and loss on a specified amount.
3. Finding simple and compound interest on specified amounts.
4. Finding the commission on a specified amount of sales during a given week.

UNIT [illegible]. SYSTEM OF MEASUREMENTS

Metric and English (Imperial)

OBJECTIVES:

The student will be able to:

1. Measure lengths using both metric and English units of measure.
2. Add and subtract using both the Metric and English units of measure.
3. Multiply and divide using both units of measures.
4. Find lengths areas and volumes of plane and solid figure usin both units of measures.
5. Change one unit of measure to another.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Metric units of measure

English units of measures (F.P.S.)

ACTIVITIES:

1. Using the units of measures in both the Metric and English System to measure lengths within the classroom.
2. Adding and Subtracting using both units of measurements.
3. Multiply and dividing using the Metric and English units of measurements.
4. Finding Areas and volumes of plane and solid figures using both units of measurements.
5. Giving exercises involving the convertion from one unit to another.

GEOMETRIC CONCEPTS

UNIT I. The Basic Figures of Geometry

Revise and extend concept of:

Points, lines, and planes. Collinear and noncollinear points. Coplanar and noncoplanar point. Segments. Difference between a segment and the measure of a segment. Rays and angles. Union and intersection of sets of points. Angles measure. The protractor. Kinds of angles. Adjacent angles. Right angles and perpendicular lines. Vertical angles. Complementary and supplementary angles. Numerical sum and difference of angles.

OBJECTIVES:

The student will be able to:

1. Distinguish among point, line half-line, segment, ray, symbolize them and extend these concepts.
2. Identify planes as parallel or intersecting.
3. Identify pairs of lines as intersecting, parallel or skew.
4. Identify sets of points as coplanar or noncoplanar; collinear or noncollinear.
5. Distinguish between a segment and the measure of a segment.
6. Use the protractor to measure and to draw angles.
7. Recognize and name angles as acute, right, obtuse.
8. Identify adjacent angles in a figure.
9. Identify pairs of angles as vertical.
10. Identify perpendicular lines or rays in a figure.
11. Determine the complement and/or supplement of an angle.
12. Find, numerically, the sum of difference of two angles whose measure have been given.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Point; line, segment, rays; collinear point; noncollinear points; plane; parallelism; skewness; estimation; adjacent angles; vertical angles, and congruence of vertical angles; perpendicular lines; complementary and supplementary angles.

INSTRUCTIONAL MATERIALS:

Short lengths of bamboo; rulers and pencils; plane sheets of papers; stiff paper; triangular pieces of stiff paper; poster paper; protractor; chalkboard and chalk. Pair of scissors.

MAJOR ACTIVITIES:

1. Marking several points on a line and naming the line in diffe ways, using the points.
2. Marking several points on a line and identifying segements and using the points.
3. Drawing a triangle and identifying the three vertices as noncollinear points, and points along one side as collinear po
4. Using the planes of the walls, floor, and ceiling of the classroom to give example of intersecting, parallel, or skew lines; intersecting or parallel planes.
5. Identifying points on adjacent walls of a room as noncoplanar; points on top of a table as coplanar
6. Using the protractor to measure and to draw different angles.
7. Identifying angles as acute, right, obtuse or straight; using straight-edge to draw acute, obtuse, right ro straight angles.
8. Estimating the degree measure of angles
9. Drawing two intersecting lines and identifying adjacent angles and vertical angles.
10. Finding a relationship between the degree measures of vertical angles.
11. Using the protractor to draw perpendicular rays
12. Finding the complement and supplement of an angle
13. Finding the numerical sum or difference of angles.

UNIT II. PLANE CURVES AND THEIR MEASURES

Section I. Simple Polygons (Mostly a Review)

Polygons. Kinds of polygons; convex and concave polygons; vertices diagonals. Kinds of quadrilaterals. Kinds of triangles; sum of angl of a triangle. Exterior angle of a triangle. Sum of angles of a polygon; $s = (n-2)180$, derived intuitively. Exterior angle of a pol Sum of exterior angles of a polygon.

Section II. Measurement of Perimeter and Area

Units of length and area:
Perimeter and area of: square, rectangle, parallelogram, triangle; right triangle. Trapezoid, circle.

n I. SIMPLE POLYGONS

IVES:

e student will be able to:

. Determine whether or not a plane figure is a polygon, and whether convex or concave

. Classify a polygon according to the number of sides it has

lassify a triangle according to sides and according to angles.

. Determine the sum of the measures of the interior and exterior angles of a polygon

n II. Measurement of Perimeter and Area

he student will be able to:

. Find perimeters and areas of simple polygons by counting

. Find areas of squares, rectangles, parallelograms, triangles, trapezoids and circles by formula

. Use the theorem of Pythagoras to find the length of one side of a right triangle when the lengths of two sides are given.

n I. MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Polygon; concavity; convexity; kinds of triangles; exterior angle f a triangle; diagonal; sum of interior angles of a polygon; xterior angle of a polygon; sum of exterior angles.

UCTIONAL MATERIALS

lers and pencils; cardboard models of different kinds of polygons; ster paper for making different kinds of polygons; scissors;

ACTIVITIES:

on I. (mostly a review)

1. Drawing pictures of plane curves on the board and asking children to identify those that are polygons
2. Drawing pictures of several polygons and asking the children to tell which are convex or concave, and asking them to classify the polygons. Also, asking the students to draw different types of polygons.
3. Drawing different triangles on the board and asking the students, to classify them according to sides and also angles. Then asking them to draw the different kinds of triangles.
4. Drawing several polygons, and drawing all the diagonals in each of them.

5. Drawing all the diagonals from one vertex of each of several polygons of increasing number of sides (3, 4, 5, 6, etc) and counting the number of triangles formed in each case. Next finding the sum of the angles in each polygon. (Note: sum of angles of a triangle = 180°).

6. In activity 5, finding a relation between the number of sides and the number of triangles, and using this relation to determine the sum of the angles of any polygon.

7. Drawing several polygons and extending a side through one vertex thus forming an angle, called the "exterior angle" at each vertex

8. Measuring the exterior angles, one at each vertex, of several polygons, then finding their sum in each case.

Section II.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Measurement, perimeter, area; pythagorean relation.

INSTRUCTIONAL MATERIALS

Ruler and pencil; yardsticks; string; dot paper graph paper; circular objects; models of plane straight line figures; (triangle, rectangle square etc.) Geoboard, elastic bands, chalk-board and chalk.

MAJOR ACTIVITIES:

1. Finding perimeters and areas by counting, of plane figures drawn on dot plane paper or graph paper.
2. Finding, by counting, perimeters and areas of figures formed on a geoboard.
3. Finding perimeters and areas of circular and other plane figures collected.
4. Finding perimeters and areas of plane figures using formula
5. Squaring the measures of the lengths of the three sides of a right triangle and comparing the square of one side with the sum of the squares of the other two sides.
6. Using the relation $a^2+b^2 = c^2$ to find the third side of a right triangle when the lengths of two sides are given.

UNIT III. CONSTRUCTION:

Construction of:

Angle bisectors; Perpendicular to a line; Perpendicular bisector of a segment; Medians and altitudes of a triangle; Right triangles; Rectangles; Triangles by SSS, SAS, ASA: Triangle similar to a given triangle.

IVES:

The student will be able to construct:

1. The bisector of a given angle
2. The perpendicular bisector of a segment.
3. The perpendicular to a line, medians and altitudes of a triangle.
4. A right triangle, and a rectangle
5. A line parallel to a given line.
6. A triangle by SSS, SAS, ASA.
7. A triangle similar to a given triangle.

AJOR CONCEPTS/IDEAS TO BE DEVELOPED

Congruence, congruence of angles; congruence of segments; congruence of triangles by SSS, SAS, ASA; Right angles; Perpendicular lines; Medians; Altitudes; Similar triangles; Concurrency.

TRUCTIONAL MATERIALS :

Ruler and compass; pencils; wax paper. Protractor (chalkboard student's). Chalkboard compass; yardstick.

OR ACTIVITIES

1. Constructing the "bisector" of an angle, using the protractor.
2. Constructing the bisector of an angle using the compass and comparing the two adjacent angles formed, using the protractor.
3. Bisecting a line segment and comparing the two parts thus formed.
4. Constructing the perpendicular bisector of a segment, and comparing the measures of the two adjacent angles formed.
5. Constructing the 3 medians of a triangle, and noting that they cross at one point.
6. Constructing the 3 altitudes of a triangle, and noting that they cross at one point.
7. Constructing pairs of triangles by SSS, SAS, ASA on stiff papers, cutting one out in each case to see if it coincides with the others.

OPTIONAL

UNIT IV. The Rational Number Line

OBJECTIVES:

The student will be able to:

1. Locate positive and negative integers, fractions, and decimal the number line
2. Draw the rational number line and plot given numbers on it
3. Estimate the numbers that match specified point on the rationa number line.
4. Compare numbers by order and use the symbols < and >
5. Determine the length of a directed segment
6. Determine the midpoint of a segment when the coordinates of th endpoints are given.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

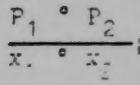
Rational number line; Coordinate of a point; Graph of a number; Estimation; Order Lenghth; Midpoint of a segment

INSTRUCTIONAL MATERIALS

Ruler for drawing number lines, Graph sheets or sheets of paper; construction paper; graphboard or plain chalkboard; pencils; marker color chalk.

MAJOR ACTIVITIES:

1. Drawing a number line and naming numbers that belong to specif points on it. (The points could first be labeled by capital le of the alphabet).
2. Putting a set of rational numbers on the board and asking the students to draw a number line that shows them
3. Naming numbers that are the same distance from zero
4. Estimating the coordinates of different points on a number line drawn on the board
5. Using the symbols < and > to compare two numbers on the number li
6. Determining the length of a segment on the number line by coun and by using the expression x_2-x_1 developed intuitively. Exampl in the figure:



; $P_1 P_2 = x_2 - x_1$

7. Determining a fromula for finding the midpoint of a segment, d intuitively: $M = \frac{x_1 + x_2}{2}$

V. MOTIONS IN THE PLANE

ion I: Revision and extension of concept of symmetry.

ion II: Reflections (Review and extend concept)
Images of plane geometric figures in the coordinate plane;
Images of points in the coordinate plane.

tion III: Rotations.
Rotations of plane figures through angles of 90°, 180° etc.

ion IV: Translations (parallel movement; or slides).

CTIVES:

1. Draw lines of symmetry if any, in a given figure.
2. Draw plane figures that possess lines or points of symmetry.
3. Draw the reflected image of a figure in the coordinate plane under reflection in the x and y axes (using graph paper).
4. Find the image of a point in the coordinate plane under reflection in the x and y axes
5. Draw "clock hand" pictures of different rotations (for example 3/4 turn clockwise; ½ turn counter clockwise, etc.).
6. Draw images of plane geometric figures in the coordinate plane under rotations of 90°, 180°, etc.)
7. Find the images of points and figures in the coordinate plane under translations.

JOR CONCEPTS/IDEAS TO BE DEVELOPED

Symmetry, reflection, rotation, translation (or parallel movement).

STRUCTIONAL MATERIALS

Graph paper, dot paper; plain sheets of paper; scissors.

AJOR ACTIVITIES:

1. Folding a sheet of paper, cutting the edges off in a zig-zag manner, then unfolding the paper to show symmetry (several folding before cutting will produce more intersecting results).
2. Finding midpoints of two opposite sides of a rectangular sheet of paper, folding and creasing the sheet along the line determined by the two points, then opening the sheet to show line symmetry. (Name the corners of the sheet A, B, C, D, respectively before folding. The reflection takes point A to point B, point D to point C, etc.).

Drawing the reflection image of a plane figure in the coordinate plane, using the x and y axes as line of reflection.

4. Finding the reflection image of an ordered pair of numbers acro
the x or y axis.
5. Drawing "clock han[illegible] pictures of different rotations, example
turn; 3/4 turn; in the coordinate plane.
6. Rotating images of figures and points 90°, 180°, etc. about
origin in the coordinate plane.
7. Finding images of figures under translations on graph paper or
paper.

UNIT VI. Space Figures

Section I: Review proportions of: Prisms; Pyramids; Cones; Spheres, Cyl

Section II: Models and sketches of: Cube, rectangular prism, triangular
triangular pyramid (tetrahedorn); square pyramid; cone, sp

Section III: Measurement of solid figures.

OBJECTIVES:

The student will be able to:

1. Review, extend, and use the basic principles of measurement.
2. Find the volume of various solids, given the appropriate dimens

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Congruence; measurement; volume, parallelism.

INSTRUCTIONAL MATERIALS

Balls, oranges, globe, tin cans, bricks, rulers, empty chalk box,
poster paper, glue, scissors, pencils.

MAJOR ACTIVITIES:

1. Describing each of the materials collected. (Example: In the c
of bricks, chalk box, etc. the opposite faces are congruent p
situation in parallel planes).
2. Making models of some of the solids listed, either from patter
cutouts.
3. Using ruler to find the dimensions of solids, and using these dimensions to find the volumes.
4. Calculating the volumes of different solids, using formulas (A
the dimensions have been given).

ALGEBRAIC CONCEPTS

I. Algebraic Operations

Properties of operation, Symbols of grouping, Exponents, like and unlike terms.

ECTIVES:

The student will be able to:

1. Add and subtract two or more algebraic expressions
2. Multiply and divide two algebraic expressions.
3. Recognize the properties of real numbers in operations.
4. Simplify expressions involving symbols of grouping
5. Recognize like and unlike algebraic terms.

R CONCEPTS/IDEAS TO BE DEVELOPED

Properties of operation, Symbols of grouping, Exponents, Algebraic expressions, like and unlike terms.

R ACTIVITIES

1. Adding algebraic expressions with like and unlike terms.
2. Subtracting algebraic expressions with like and unlike terms.
3. Multiplying polynomials by monomial/binomial.
4. Dividing polynomials by monomial/binomial.

II. OPEN SENTENCES

Open sentence in one variable, Graph, Relation, Function (Linear).

TIVES:

The student will be able to:

1. Regognize an open sentence
2. Differentiate between an open sentence and an algebraic expression.
3. Differentiate between a relation and a function.
4. Solve simple open sentence in one variable.
5. Determine the domain and range of a relation/function.
6. Construct the graph of a relation and a function.

CEPTS/IDEAS TO BE DEVELOPED

Open sentence, variable, Relation, Function, Solution set, Linear Function.

MAJOR ACTIVITIES:

1. Recognizing open sentences, and giving examples of open sentences.
2. Differentiating between open sentences and algebraic expressions.
3. Differentiating between relations and functions.
4. Solving simple open sentence problems involving coins and age.
5. Graphing simple linear open sentences involving two variables.
6. Graphing the solution set of an open sentence on the number line.

PROBABILITY AND STATISTICS CONCEPTS:

UNIT I. Graph (Pictographs, Bar Graphs, Line Graphs, and Circle Graphs)

OBJECTIVES:

The student will be able to construct, read and interpret pictographs. Bar Graphs, Line Graphs, and Circle Graphs.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Data; bar graph; line graph; pictograph; circle graph.

INSTRUCTIONAL MATERIALS:

Color chalk and pencils; markers; construction and graph papers; pens and pencils; attendance and enrollment records of students over a definite period of time; tapeline; scale; plain sheets of paper; scissors.

MAJOR ACTIVITIES:

1. Collecting and organizing information on students' heights, weights, ages, enrollment, sex, attendance.
2. Constructing pictographs, bar graphs, line graphs, and circle graphs based on data collected.
3. Interpreting information from given pictographs, bar graphs, line graphs, and circle graphs.
4. Discussing major advantages and disadvantages in presenting information using each of these four types of graphs.

UNIT II: Games of Chance (Ludo, Snake and Ladders, Coin Tossing, and Cards)

OBJECTIVES: Student will be able to compute probability values of events through games of chance.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Probability of events.

INSTRUCTIONAL MATERIALS

Ludo; deck of cards; coins; Snake and Ladders; empty cans; plates or bowls; marbles; maggi cubes; beads of different colors; dice; graph sheets.

MAJOR ACTIVITIES:

1. Playing and discussing about various games of chance (ludo, snake and ladder, cards, and coin tossing).
2. Rolling dice, tossing coins, choosing cards, and selecting objects from given containers while listing possible outcomes of each of these experiments.
3. Writing events of given outcomes from experiments performed.
4. Stating or writing probability of events from experiments performed.

SCOPE AND SEQUENCE

NINTH GRADE

I. ARITHMETIC SKILLS

SET

Set Complements: Venn Diagram
Operations - Union and Intersection
Using Venn Diagram. Power Set

NUMBER THEORY

Factors, Exponents. LCM, LCD, GCD.
Perfect numbers. The Sieve of Eratosthenes
Divisibility rules.
The Pythagorean Theorem. Triangular numbers

OPERATIONS

Rational and irrational numbers. Decimals - terminating and repeating. Logarithms - Percentage problems:

Interest - compound
Discount
Commission
Partnership
Texes
Ratio, Proportion and Variation
Speed, Average and rate of working.

MENSURATION - OPTIONAL

Metric system and FPS (Foot-pound-second)
Length, area, volume and weight

GEOMETRIC CONCEPTS

Basic Geometric Figures and their Properties

Review and extend work done in Grade 8
Further explorations of the line and its subsets. Density; continuity; betweenness. Formal definition of line segment.

Parallel Lines:

Transversals; pairs of angles formed by a transversal, properties of parallel lines

Simple polygons and their properties

Sum of interior angles of a polygons: $S=(n-2)180$
Regular polygons
Sums of exterior angles of a polygons. (360°)

Review: Perimeters; Area of:

Square, rectangle, parallelogram, triangle, trapezoid, circle, sector of a circle, segment of a circle, right triangle.

Construction of: .

Perpendiculars
Parallel lines
Rt. Triangle
Special angles and their combinations (30°, 45°, 60°, 75°, etc.)

Rectangles
Parallelograms
Triangles by SSS, SAS, ASA
Congruence (intuitive) through constructions

OPTIONAL: COORDINATE GEOMETRY

The real number line
Distance; absolute value of a number (= its distance from 0 on the number line).
Graphing in the Cartesian plane; graphs of relations and functions
Midpoint of a segment in the plane
Distance between two points in coordinate plane
Graphs of sets of open sentences in two variables.
Slope
The right triangle and the Theorem of Pythagoras; application
Scale drawing.

Motions in the plane

Review and extend work on:
Reflections; rotations and translations

Space Figures

- Condition for determining a plane
- Relations between lines and planes
- Intersecting planes
- Moders and sketches
- Further work on surface areas and volumes

Enrichment:

- Vectors in the plane
- Concept of a vector
- Difference between a vector and a segment
- Vector as an ordered pair of real numbers
- Initial point and terminal point of a vector
- Vector components
- Magnitude (length) of a vector
- Equivalent vectors
- Addition of vectors (algebraic and geometric); resultant
- Applications of vectors

III. ALGEBRAIC CONCEPTS

Exponents (only positive integers)

Factors and special products

- Product of monomial and polynomial
- Product of two binomials
- Special products - $(a+b)^2$; $(a+b)$ etc.
- Common monomial factor: difference of two squares
- Factors of quadratic trinomial of type ax^2+3x+c, with a a
- Operations on polynomials, including Radicals - simple

Relations and functions

- Cartesian product
- Domain and range
- Mapping diagrams
- Evaluation of functions
- Graphs-Linear functions in two variables, slope; absolute value functions

OPTIONAL: LINEAR OPEN SENTENCES

- One variable including formulas
- Two variables - algebraic and graphical solutions
- Applications to coin, digit, age, investment problems,

TRIGONOMETRIC CONCEPTS

Trigonometric Functions

Sine, Cosine, and Tangent of angles of right triangles.

Introduction to use of trigonometric tables (for angles between 0° and 90°)

Applications of sine, cosine, and tangent of angles in solving problems.

Angles of Elevation and depression.

PROBABILITY AND STATISTICS CONCEPTS

Construction, reading, and interpretation of pictographs, bar graphs, line graphs, and circle graphs.

Frequency tally, frequency, means, mode, median, and range of ungrouped data.

Concept of P(A or B) and P(A and B); tree diagrams;

Computing P(A or B) and P(A and B) through games of chance.

UNIT CONTENTS/ACTIVITIES

NINTH GRADE

I. ARITHMETIC SKILLS

UNIT I: Set and Number Theory

Section I: Complement
Operation
Power Set
Universal Set

OBJECTIVES:

The student will be able to:

1. Find set complement using a Venn Diagram
2. Find the union and intersection of two or more sets using Venn Diagram, and by listing.
3. Find the power set of a finite set.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Complement, Power set, Finite Set, Universal set.

MAJOR ACTIVITIES:

1. Using two or more subsets and the Universal set to find set comp of the Universal set.
2. Using Venn Diagram in finding the union and intersection of two or more sets.
3. Finding the number of subsets in any given set by using power set rules, and by listing.

Section II: Number Theory

Factor, Exponents, Perfect number, the Sieve of Eratosthenes, Divisibility rules, Triangular numbers, Pythagorean Theorem.

OBJECTIVES:

The student will be able to:

1. Factor a given number
2. Express a given number in the expanded notation, using exponents.
3. Select a perfect number from a given set or numbers.
4. Use divisibility rules in dividing large numbers
5. Use the Sieve of Eratosthenes to find prime numbers between one hundred.
6. Select Triangular numbers from a certain given number of dots.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Exponents; factors, Perfect number; Triangular number Pythagorean Theorem.

MAJOR ACTIVITIES:

1. Finding factors for two or more digit numbers.
2. Using exponents to find the common factors for two or more numbers in the same base (ten).
3. Using exponents in finding place values of bases other than ten.
4. Experimenting to find how many perfect numbers there are between one and ten.
5. Using the Sieve of Eratosthenes to find the prime numbers between one and one hundred.
6. Using the divisibility rules to test divisibility of given numbers by 3, 4, 6, 7, 8, 11, etc.
7. Using the units of any two sides of a right angled triangle to find the other side.
8. Forming a triangle from a given set of dots.

UNIT II: Operations

Section I: Rational numbers
Irrational numbers
Repeating Decimals
Non-repeating Decimals

OBJECTIVES:

The student will be able to:

1. Add and subtract rational numbers.
2. Multiply and divide rational numbers.
3. Differentiate between rational and irrational numbers.
4. Differentiate between repeating and non-repeating decimals.
5. Convert repeating decimal to rational fraction and vice-versa.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Rational numbers, Irrational numbers
Repeating decimals, Non-repeating decimals

MAJOR ACTIVITIES

1. Adding and subtracting rational numbers.
2. Adding and subtracting irrational numbers.
3. Multiplying and dividing rational numbers.

4. Multiplying and dividing irrational numbers.
5. Changing repeating decimals to fractional numbers.
6. Changing fractions to repeating decimals.
7. Finding repeating and non-repeating decimals from a given set of fractional numbers.

Section II: Logarithms and Percent problems

OBJECTIVES:

The student will be able to:

1. Read Lograithms in division and multiplication.
2. Use Logarithms in division and multiplication.
3. Solve problems involving:
   a. Interest
   b. Commission
   c. Ratio
   d. Proportion
   e. Partnership
   f. Taxes
   g. Speed
   h. Average rate

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Logarithm, Partnership, Commission, Investment, Ratio, Proporti Speed, Average rate.

MAJOR ACTIVITIES:

1. Reading the logarithm of a number from a log table.
2. Finding a number in the table when the log is given.
3. Using logarithms in multiplying large numbers.
4. Using logarithms in division.
5. Finding simple and compound interest on a given amount.
6. Finding profit and Loss on certain amount of money.
7. Using ratio and proportion to find the shares of partners in business.
8. Finding taxes on properties when the rate and valuation are g
9. Finding commission on the amount of goods sold.
10. Finding distance and average speed of a vehicle.
11. Finding average rate of working.

II. Geometric Concepts

UNIT I: Basic Figures of Geometry

Section I: Review and Extension of:

Concept of point, line, plane, ray, angle.
Measurement of length and angle. Special angles and angle pairs.
Addition and subtraction of angles numerically.
Sum of angles of a triangle (See similar work done in grades 7 and 8).

OBJECTIVES: (See objectives for similar materials in grades 7 and 8).

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Any two points of a line name the line. Intersection. A line and a plane either intersect or do not intersect. Opposite rays, Angle. The vertical angles formed by two intersecting lines are congruent. Angles opposite the congruent sides of an isosceles triangle are congruent, and vice versa. An equilateral triangle is equiangular, and vice versa.

INSTRUCTIONAL MATERIALS

Compasses, straight-edge, protractor (including chalkboard ruler and compasses).

MAJOR ACTIVITIES

1. Drawing a plane and a line, so that:
   i. the line is not in the plane
   ii. the line is in the plane
2. Drawing a plane and two lines so that one line intersects the plane, and the other does not.
3. Labelling four collinear points A, B, C, and D on a line.
4. Drawing 3 or more concurrent lines and identifying the pairs of vertical angles formed. Comparing the degree measures of the angles in each pair.
5. Drawing several isosceles triangles and comparing the degree measures of the angles opposite the equal sides in each triangle.
6. Constructing a triangle with two congruent angles and comparing the lengths of the sides opposite the congruent angles.
7. Investigating the relationship between the angles of an equilateral triangle; and between the sides of an equiangular triangle.

Section II: Further Explorations of the Line and its Subsets

Density, continuity; Betweenness of points. Formal definition of line segment. Types of non-intersecting lines - parallel and skew lines.

OBJECTIVES:

The student will be able to:

1. Describe and illustrate the concepts of density and continuity regarding the line.
2. State and illustrate the property of betweenness of points.
3. State and illustrate the definition of line segment.
4. Distinguish between the two types of non-intersecting lines, and between parallel planes and intersecting planes.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Density; Continuity; Betweenness; Line segment; Parallel and Skew lines Transversal; Parallel planes; intersecting planes.

INSTRUCTIONAL MATERIALS

Ruler; Compass; Protractor; Empty chalkbox or shoebox.

MAJOR ACTIVITIES:

1. Marking three collinear points A,B, and C, and asking the students to tell which is "between" the other two.

2. Marking three points P_1, P_2, and P_3 on a number axis, with coordin X_1, X_2, and X_3 respectively, and asking the students to order the coordinates ($X_1 < X_2 < X_3$, or $X_1 > X_2 > X_3$).

3. Drawing the whole number line, and asking the students to tell for example, whether there is a point corresponding to a whole number between 4 and 5; between 7 and 8. Doing the same activity for the integral number line; the rational number line; but asking for integers between -4 and -5; between $\frac{1}{4}$ and $\frac{1}{2}$, respectively.

4. Drawing the real number line and asking if there are points corresponding to the numbers 5; 1/3; 1/2, etc.

5. Drawing AB on the chalkboard, then asking:

    i. Mark a point x on AB, but don't use point A or point B. Does x lie between A and B?

    ii. Does A lie between X and B?

    iii. State a simpler name for the number AX + XB: for AB - AX.

6. Using the sides, top and bottom of a chalkbox, or walls, ceiling, the classroom to illustrate parallel planes and intersecting plane

7. Using the edges of a chalkbox to illustrate parallel and skew line

8. Using stiff paper to make models illustrating parallel planes, and skew or intersecting lines.

II: Parallel Lines and Polygons

tion I: Parallel Lines

Parallel lines in a plane. Transversals. Interior and exterior angles. Pairs of angles formed by a transversal - corresponding angles; alternate interior angles; interior angles on the same side of the transversal; properties of parallel lines.

CTIVES:

The student will be able to:

1. Identify with respect to two lines cut by a transversal, these kinds of angles: interior; exterior; alternate; corresponding; interior angles on the same side of the transversal.
2. Identify the transversal in a given figure when one pair of the angles listed above is known.
3. Identify pairs of congruent angles when a pair of parallel lines is cut by a transversal.
4. List the properties of parallel lines.
5. Find the degree-measures of specified angles in given figures, using the properties of parallel lines.

R CONCEPTS/IDEAS TO BE DEVELOPED

Corresponding angles, alternate interior angles; interior angles on same side of transversal. *Congruence of alternate interior angles; congruence of corresponding angles.*

(*when these angles are formed by a transversal cutting two parallel lines). Properties of parallel lines.

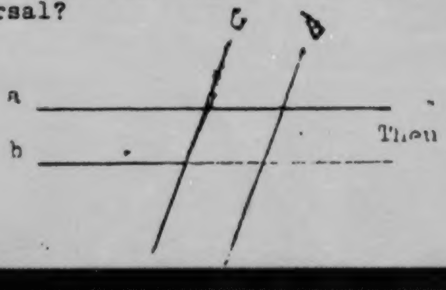
RUCTIONAL MATERIALS

Compass; rulers; protractors.

R ACTIVITIES

1. Draw two lines a and b, and a third line c, intersecting both a and b. Mark the 8 angles formed with the numerals 1 - 8, then:

   (i) Name the transversal (ii) Name two pairs of alternate interior angles (iii) Name two pairs of corresponding angles (iv) Name two pairs of interior angles on the same side of the transversal.
2. Draw a pair of parallel lines, and a transversal. Compare the degree measures of corresponding angles. Do the same with alternate interior angles. What is the sum of the measures of the interior angles on the same side of the transversal?
3. Draw two pairs of parallel lines



Then

i. Name all the congruent angles in the figure.

ii. Identify the transversal with respect to a named pair of angles.

iii. Find the degree measures of the remaining angles in the figure when the degree measure of one angle is given.

Section II: Polygons (Review)

Review:

Convex and concave polygons. Regular polygons. Diagonals of a polyg
Sum of interior angles; measure of interior angles of a regular poly
Sum of exterior angles of a convex polygon. Measure of an exterior
of a regular polygon of n-side.

OBJECTIVES:

The student will be able to:

1. Find the sum of the interior angles of a polygon, using the for $s = (n-2)\ 180°$
2. Determine the measure of each interior or exterior angle of a re polygon of n-sides
3. Determine the number of sides of a regular polygon when the mea of each interior angle or the measure of each exterior angl known.
4. Give the sum of the exterior angles of a polygon of n-sides.
5. Determine the number of sides of a polygon when the sum of the is given.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Patterns in geometry (for example, the number of diagonals drawn fr
one vertex of a polygon of n-side is 3 less than the number of side
$S=(n-2)\ 180°$, where s is the sum of the measures of the angles of a
polygon and n is the number of side. Measure of an interior angl
regular polygon is $(n-2)180°$, and of an exterior angle, $\frac{360°}{n}$

INSTRUCTIONAL MATERIALS

Ruler, protractor, stiff paper, scissors.

MAJOR ACTIVITIES:

(Let each pupil carry out the following activities:)

1. Draw the following:

   Regular quadrilateral
   Regular pentagon
   Regular hexagon, etc.

a large convex quadrilateral from a sheet of paper. Tear off the rners and fit them together side-by-side at a point on a line, with vertices touching. What happens?

w a large convex quadrilateral and measure each of its angles. at is their sum? Repeat this activity for a pentagon, a hexagon, etc.

all the diagonals from one vertex of each of several polygons, then wer the following questions:

i. Find a relationship between the number of sides and number of triangles.

ii. Find a relationship between the number of diagonals drawn from one vertex and the number of triangles formed.

iii. Find a relationship between the number of sides and the number of triangles.

iv. What is the sum of the angles of the triangles in each polygon?

v. What is the sum of the angles of each polygon?

vi. Write a formula for finding the sum of the angles of a polygon of n sides.

nd the sum of the angles of any convex polygon, using the formula eloped in #4 (vi).

nd the number of sides of a polygon when the sum of the angles is given.

large is each angle of an equilateral triangle? A square? A regular ntagon?

nd the measure of each interior angle of other regular polygons. velop a formula for finding the measure of each interior angle of a ular polygon of n sides.

raw a polygon and form an exterior angle at each of the vertices. at is the sum of the measures of these angles? Repeat the exercise r several other polygons.

at is the measure of each exterior angle of a square? Equilateral riangle? Regular Pentagon? Regular Octagon? Regular n-gon?

ite an expression for finding the measure of an exterior angle of a ular polygon of n sides.

II: Perimeters And Areas of Plane Regions

aning of perimeter and area. Choice of unit of area. The area ngruence postulate. The area addition postulate. Triangulation. rimeter and area of: square, rectangle, parallelogram, triangle, rapezoid. The right triangle and the theorem of Pythagoras. Circle; ector and segment of a circle.

OBJECTIVES:

The student will be able to:

1. Find the areas and perimeters of the following plane figures: triangle, square, trapezoid, parallelogram, sector of a circle, segment of a circle.
2. Use the Theorem of Pythagoras to solve numerical problems.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Perimeter of a closed figure (as the length of boundary) Area of a figure (as amount of surface within its boundary). Perimeters are measured in linear units, while areas are measured in square units. Both length and area are numbers.

INSTRUCTIONAL MATERIALS:

Ruler, compasses, protractors (for measuring angles of sectors), Sc poster paper.

MAJOR ACTIVITIES:

1. Finding the sum of the areas of the four walls of the classrocm.
2. Finding a formula for calculating the sum of the areas of the f walls of the classroom.
3. Drawing a rectangular box whose edge are a, b, c, units, and fi the entire surface area in terms of a,b. and.c.
4. Finding the area of a polygonal region by dividing the r triangles, rectangles, or trapezoids, or a combination of these figures.
5. Dividing a trapezoid into two triangles and finding the sum of areas of the triangles; then comparing the sum of the areas of two triangles with the area of the trapezoid which has been fou by using the formula $A = \frac{h}{2}(b' + b)$.
6. Comparing the measure of the area of a rectangle with the measu of its perimeter.
7. Comparing the areas of various rectangles. For example, compari the areas of squares with sides of 1,2,3,4---units, Also compar the perimeters of various rectangles.
8. Drawing a parallelogram on graph paper and finding the area by counting the small squares.
9. Transforming parallelograms into rectangles by cutting cardboar figures.
10. Using the figure in activity 8 to find a formula for the area parallelogram.
11. Finding the areas of various parallelograms, using the formula obtained in activity 10.

12. Cutting along diagonal BD of parallelogram ABCD and showing by superimposing ABD on CBD that the two triangles have equal areas, and that each area equals half the area of the parallelogram or $A = \frac{1}{2}bh$.

13. Using the formula obtained in 12 to calculate the areas of various triangles.

14. Using the Pythagorean relation ($c^2=a^2+b^2$) to calcuate the third side of a right triangle when the lengths of two sides are known

15. Performing experiments to discover the value of pi(π) by comparing the diameters and circumferences of each of several circular objects, such as tin cans, coins, etc.

16. Discovering the formula for the area of a circle through the "parallelogram approach".

17. Using the formulas obtained in 15 and 16 to calculate the circumferences and areas of different circles.

18. Using the formula $A= \frac{x}{360} (\pi r^2)$ to calculate the areas of sectors of different circles.

UNIT IV: Construction (A Review from 8th Grade) Optional

CONSTRUCTION OF:

Perpendicular to a line at a point on the line. Perpendicular to a line from a point outside the line. Right triangle. Special angles (30°, 45°, 60°, 67½°, 315° etc.). Rectangles, Squares, Parallel to a line, Parallelogram. Triangle by SSS and ASA.

OBJECTIVES:

The student will be able to construct:

1. A perpendicular to a line at a point on the line or from a point outside the line.
2. A right triangle, given one of the special angles above, and a leg or the hypotenuse.
3. Angles of 30°, 45°, 225°, etc. by first besecting a straight angle.
4. A square, given a side or the perimeter.
5. A rectangle, given two adjacent sides.
6. A parallel to a line by means of alternate interior or corresponding angles.
7. A parallelogram, given two adjacent sides and the angle between them.
8. A triangle by SSS, SAS, and ASA.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

There is only one perpendicular to a line either at a point on the li or from a point outside the line, all lines being in the same plane. Parallel postulate. Congruence of triangles by SSS, SAS and ASA.

INSTRUCTIONAL MATERIALS

Compasses, straight-edge (or ruler). Scissors; Poster paper.

MAJOR ACTIVITIES:

1. Constructing a perpendicular to a line at a point on the line or from point outside the line, then measuring the adjacent angles formed to see what kind of angles they are.
2. Constructing angles of 45°, 22½°, 67½°, etc; by first bisecting a straight angle.
3. Constructing angles of 60°, 120°, 150°, etc, by first constructin an equilateral triangle
4. Constructing right triangles by LA, HA, ($\angle$A=45°, 22½°, 60°, 75°, etc) or LL.
5. Constructing a square when the perimeter is given or a rectangle when the adjacent sides are given.
6. Constructing a line through each vertex of a triangle parallel to the opposite side.
7. Constructing a parallelogram when two adjacent sides and the angl between them is given.
8. Drawing a triangle, example, $\triangle$APC and constructing another trian example, $\triangle$DEF so that DE = AB, EF = BC and DF = AC, then cutting $\triangle$DEF out, placing it on $\triangle$ABC to see if they coincide. Performing similar experiments for SAS, ASA.

UNIT V: The Coordinate Plane Optional

The real number line. Distance on the number line. Absolute value of number (its distance from zero on the number line). Graphing in the Cartesian plane; ordered pairs. Relations and functions. Domain and r of a relation; domain and range of a function. Graphs of relations an functions. Midpoint of a segment in the plane. Distance between two points in the coordinate plane. Graphs of sets of open sentences in variables. Slope. Scale drawing.

OBJECTIVES:

The student will be able to:

1. Determine the distance between two points on the number line when the coordinate of these points are given
2. Determine the midpoint of a segment on the number line when the coordinates of the end points are given.

3. Tell whether or not a given relation is a function
4. Construct and interpret the graphs of relations and functions
5. Determine the midpoint of a segment in the plane
6. Determine the distance between two points in the plane
7. Graph sets of open sentences in two variables
8. Determine the slope of a line from the graph
9. Make a scale drawing of a given region

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Coordinate axes; origin; coordinate plane; ordered pairs; graph of an ordered pair. Horizontal and vertical distances. Relation. Domain and range; Function. Variable. Distance in the plane. Open Sentence. Slope. Scale drawing.

MAJOR ACTIVITIES:

1. Counting the number of units between several of two points on the number line, and using the experience gained to derive the expression $|x_2 - x_1|$ for dinding the length of the directed segment with endpoints x_1 and x_2.
2. Using the formula $M = \frac{x_1 + x_2}{2}$ (derived in grade 8) to compute the coordinate of the midpoint of a segment on the number line.
3. Naming examples of relations from daily life. For example, the relation "is a brother of". Also naming examples of functions in daily life.
4. Writing a set of ordered pairs that is a function; and a set of ordered pairs that is not a function.
5. Finding the domain and range of a relation and of a function; for example, the domain and range in activity 4.
6. Graphing sets of ordered pairs that are functions, and sets of ordered pairs that are not functions.
7. Graphing functions that are named by two variables.
8. Conducting experiments to find an expression for the midpoints of a segment in the plane (when the coordinates of the endpoints are given), and using this formula to find the midpoints of segments on the line or in the plane.
9. Using the distance formula calculate the distance $d=\sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$ to between two points in the plane.
10. Finding the distance between places in Liberia, using the scale indicated on a map of Liberia.
11. Finding, graphically, the intersection of two lines named by pairs of equations in two variables.

12. Finding the slopes of lines drawn on a coordinate grid by using the concept "ratio of vertical distance to horizontal distance".
13. Using a scale (say 1:4) to draw a map of the floor of the classr

UNIT VI: Motions in the Plane

Section I: Reflections (or folding Movements)

Review of concept of reflection; examples of reflections; reflections in (or over) a line. Image and preimage; reflection image of a point with respect to a line. Reflection across the axes (Example: reflectic of (2,3) over the x or y-axis; Reflection of sets of points; reflectic of asegment over a line; reflection of a polygon over a line.

Section II: Rotations (Turning Movements)

Review and extension of concept of a rotation. Examples of rotation, Rotation about a point; center of rotation. Rotating a given plane geometric figure through a given angle. Magnitude of a rotation. Dire of a rotation. Successive reflections through two intersecting lines. Rotating points in the coordinate plane. (By $\frac{1}{4}$, $\frac{1}{2}$ 2/3, etc.

Section III: Translation (Parallel Movements, or Slides)

Review and extension of concept of a translation. Translating a plane geometric figure across two parallel lines by successive reflections. Translating ordered pairs of points in the coordinate plane. Finding the rule for translations of points in the coordinate plane. For exa in (x,y) ______ (x+3, y+4), the translation moves the points right 3 up 4.

OBJECTIVES:

The student will be able to:

1. Find the images of points and figures in the coordinate plane un the reflections in the x- and y- axes.
2. Find the images of points and figures in the coordinate plane un translations.
3. Write the function rule for a verbal description of a transla and conversely, write a verbal description of such a function

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Image; pre-image; reflection image of a point or sets of points with respect to a line. Each point has exactly one image under a reflecti Reflection acts like a fold (or flip) over a line. Reflection across y-axis is a function. Rotation; magnitude of a rotation; direction of a rotation. Successive reflections. Translation of ordered pairs of in the coordinate plane. Rule for a translation of an ordered pair points. A translation acts like a slide.

STRUCTIONAL MATERIALS

Graph paper or dot paper

[illegible] ACTIVITIES

Section I: (Reflection)

1. Using paper folding to demonstrate reflection. For example, draw a triangle on thin paper. Fold the paper so that the triangle is covered. Now trace the triangle on the folded part of the paper. Unfold the paper and trace the tracting. What happens?
2. Finding the reflection image of each of several points with respect to a given line.
3. Finding the reflections of given ordered pairs of points across the axes in the coordinate plane. Writing the function rules for the reflections where possible.
4. Finding the reflection of a given segment with respect to a line.
5. Drawing the reflection of given polygons across given lines.
6. Using reflections to find the number of folding symmetries of the following figures.
7. Square; rectangle; isoceles triangle; equilateral triangle; circle.

Section II: (Rotations)

1. (When you open or shut the classroom door, the door rotates through an angle). Name other examples of rotations.
2. Draw a ray; call it AB. Find the image B of B under a rotation with center A, and a magnitude of 60°
3. Repeat activity 2 for several different positions and for different magnitudes.
4. Draw plane figures in the coordinate plane and rotate them around the origin ($\frac{1}{4}$, $\frac{1}{2}$, 2/3 turns, etc.).
5. Rotate given ordered pairs of points in the coordinate plane and write the rules for these rotations (for example, for a counter-clockwise rotation of 180°, the rule is $(x, y) \longrightarrow (-x, -y)$.

Section III: (Translations)

1. Draw a polygon, say triangle ABC. Draw two parallel lines, l_1 and l_2 to the right of ABC. Reflect ABC first across l_1 then across l_2 The last reflected image is a translation of the original triangle. This is an example of a parallel movement.
2. Translate each of several polygons by means of parallel movements.
3. Translate ordered pairs (of points) in the coordinate plane and if possible find the rule for each translation. (For example the translation that moves points "right 2, up 3" has the rule $(x,y) \longrightarrow (x+2, y+3)$.

UNIT VII: Space Geometry: Points, Lines & Planes

Section I: Points, Lines, and Planes
Concepts of a space figure; intersections, Parallel Planes; Perpendicular planes; Skew lines; Parallel lines.

Section II: Volumes and surface areas of space figures.

OBJECTIVES:

The student will be able to:

1. Tell whether a given geometric figure is a plane or space figur (i.e., whether it is one -, two -, three - dimensional).
2. List some properties of space figures.
3. Name sets of coplanar points, using a chalkbox or the classroom.
4. Give examples of parallel or intersecting planes, and of skew l
5. Name the geometric figures formed by the intersection of two pl and by a plane and a line not in the plane.
6. Observe that three noncollinear points determine exactly one pl
7. Sketch intersecting planes, and show lines intersecting planes.
8. Represent a plane and lines in a plane.
9. Determine the surface areas and volumes of different space figu
10. Make models of given space figures.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Space; Space figure. Intersections. Plane. Parallel planes; Perpend planes; Skewness.

Two planes intersect in a line. Three points determine a plane.

INSTRUCTIONAL MATERIALS

Pieces of cardboard to represent planes; short lengths of bamboo or pencils to represent lines. Chalkbox or shoe box. Tin cans. Thumbt

MAJOR ACTIVITIES

Section I: Points, Lines and Planes

1. Use your classroom to name examples of:
   (a) line segments (e.g. the intersection of two adjacent walls)
   (b) parallel planes, intersecting planes, intersecting planes
   (c) Skew lines; parallel lines
2. Classify given geometric figures as one-, two-, or three- dime
3. Make a sketch of a chalkbox and label the corners consecutivel the letters A to H. Use the letters to name as many coplanar p (at least three in a set) as you can.

4. Letting your pencil represent a line and a piece of cardbboard represent a plane, show the pencil intersecting the carboard.
5. Fold a sheet of paper and make a crease. Name the geometric figure formed by the crease.
6. Place on a table three thumtacks pointed upward, but not in a line, Place a piece of cardboard on them. Can they support the cardboard free of the table? Can two such thumbtacks? Can one? (If there are no thumbtacks, then use the tips of three fingers: thumb, index finger, and middle finger).
7. Sketch two or three intersecting planes.

UNIT VIII: Vectors in the Plane

Concept of a vector. Difference between a vector and a segment. Vector as a directed segment. Vector as an ordered pair of real numbers in the coordinate plane. Initial point and terminal point of a vector. Vector in standard position. Vector components. Magnitude (or length) of a vector. Equivalent vectors. Vector addition; resultant. Applications.

OBJECTIVES:

The student will be able to:

1. Distinguish a vector from a segment
2. Determine a vector when its initial and terminal points are given
3. Draw a vector when its initial and terminal points are given
4. Determine the components of a vector when the coordinates of the initial point and terminal points are given.
5. Determine the magnitude (or length, or norm) of a vector.
6. Differentiate between equivalent and nonequivalent vectors.
7. Find the sum of two vectors.
8. Use vectors principles to solve problems on velocity, forces, etc. (for example, in Physics, to find the horizontal component of a force of x grams acting at an angle of say 30° to the horizontal).

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Vector. Initial and terminal points. Standard position. Vector components; Magnitude (or length) of a vector. Equivalent vectors. Resultant.

INSTRUCTIONAL MATERIALS: Graph paper; rulers; pencils color pencils.

MAJOR ACTIVITIES

1. Draw several parallel segments of equal lengths on your paper. Then draw another set of parallel segments of equal lengths, but with "arrows". The arrow, for example, $\overrightarrow{AB}$, donates the segm directed from A to B. This directed segment is called "vector A The initial point is A and the terminal point is B. (Note AB is different from $\overrightarrow{BA}$).

2. The vector formed by A(a,b) to B(c,d) is the vector C(c-e, d-b). Determine the vector formed by given ordered pairs.

3. Compare $\overrightarrow{AB}$ with $\overrightarrow{BA}$, given the coordinates of A and B.

4. Draw and label vector of types $\overrightarrow{AB} = (3,-4)$; $\overrightarrow{CD} = (1,3)$, etc.

5. Find the horizontal and vertical components of several differen vectors. Example, (i) A(3,0); B(4,4) (ii) A(4,2); B(2,-1), etc.

6. Find the magnitude of each vector in activity 5.

7. Which of the vectors in activity 5 are equivalent?

8. Find the sum (resultant) of several given vectors.

9. Sketch a vector to represent each of the following: Use a coord system and name the coordinate of the terminal.

   Point of each vector:
   A. A force of 40 lbs acting to the north.
   B. A force of 10 lbs acting at a heading of N30°E
   C. A velocity of 200 km per hour N45°E

10. Find the resultant of vectors of the following types:

    A. A force of 60 lbs acting to the north
       A force of 20 lbs acting to the northeast.
    B. An airplane is flying at a heading of N40°E at 100 mph
       A wind of 45 mph is blowing eastward. Find the speed and direction (resultant) of the plane.

11. Find the horizontal component of given forces acting at given degrees to the horizontal.

ALGEBRAIC CONCEPTS

I: Algebraic Operations

Factors and Special Products, Exponents, (positive integers).

TIVES:

The student will be able to:

1. Add and Subtract algebraic expressions.
2. Multiply and Divide two algebraic expressions.
3. Use the laws of exponents when multiplying and dividing two algebraic expressions.

R CONCEPTS/IDEAS TO BE DEVELOPED

Factor, exponent, special product, binomial.

R ACTIVITIES

1. Finding the sum and difference of two binomial expressions.
2. Finding the product and quotient of two binomial expressions.
3. Finding the common factor of two binomial expressions.
4. Finding the special product of two binomial expressions by inspection.

II: Relations and Functions

Domain, range, mapping, evaluating a function, graphing; slope.

CTIVES:

The student will be able to:

1. Differentiate between domain and range.
2. Tell whether a given relation is a function.
3. Evaluate a given function.
4. Find the slope of the graph of a given function.
5. Graph a given function in one or two variables.

R CONEPTS/IDEAS TO BE DEVELOPED

Domain, range, mapping, graphing, slope, variable, relation, function.

R ACTIVITIES

1. Finding the domain and range of a given function.
2. Giving examples of relations and functions.

3. Evaluating a given function.
4. Finding the slope of the graph of a given function.
5. Graphing a function with one or two variables.
6. Drawing mapping diagrams of functions.

UNIT III: Factors And Special Products

Monomial, binomial, polynomial, products, factor.

OBJECTIVES:

The student will be able to:

1. Find common monomial of factor.
2. Find the factors of the difference of 2 squares
3. Find the factors of a polynomial of the type $ax^2 + bx + c$ with a
4. Find the product of two binomial terms.
5. Find the product of a trinomial and a binomial.
6. Find by special product, the expressions $(a+b)^2$, $(a-b)$, etc.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Momomial, binomial, trinomial, polynomial factor, special product.

MAJOR ACTIVITIES

1. Finding the common monomial factor of a polynomial.
2. Finding the factors of the difference of two squares.
3. Finding the factors of a trinomial like $ax^2 + bx + c$, where a =

TRIGONOMETRIC CONCEPTS

metric Ratios of Angles (Derivation, Determination by use of Tables, lications)

IVES:

The student will be able to:

1. Compute the numerical values of the ratios representing the sine, cosine, and tangent of angles by using right triangles.
2. Use the trigonometric tables to determine the sine, cosine, and tangent of angles with measures of zero through ninety degrees.
3. Use the three trigonometric ratios to solve story problems pertaining to ladders, flagpoles, angles of elevation and angles of depression.

CONCEPTS/IDEAS TO BE DEVELOPED

Sine; cosine; tangent; angles of elevation and depression.

CTIONAL MATERIALS

Right rectangular cut-outs; plain, construction, and graph sheets; rulers; pens; pencils; protractors; sticks; trigonometric tables.

ACTIVITIES:

1. Measuring the sides of right similar triangles drawn on graph or dotted sheets.
2. Using the results of the measurement to determine the following ratios for given angles of right similar triangles. (opposite side/hypotennuse; adjacent side/hypotennuse; and opposite side/adjacent side).
3. Discussing the conventional terms associated with the ratios: sine, cosine, tangent.
4. Determining the trigonometric functions of angles with measures of zero through ninety degrees by using the trigonometric tables.
5. Using trigonometric ratios to find given angles and sides of right triangles without interpolation (of trigonometric functions of angles).
6. Using the three trigonometric functions to solve story problems pertaining to ladders, flagpoles, and angles of elevation and depression.

PROBABILITY AND STATISTICS CONCEPTS

UNIT I: Measures of Averages and Scatter

OBJECTIVES:

The student will be able to:

1. Write frequency tally and corresponding numerical equivalence o frequencies of ungrouped data.
2. Write the mode of ungrouped data.
3. Compute the mean, median, and range of ungrouped data.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Mean; mode; median; range; frequency tally; data.

INSTRUCTIONAL MATERIALS:

Scale; tapeline; plain sheets of paper; graph and construction pape pens; pencils; markers; records of test scores and enrollment of students in various classes over a given period of time; record of promotions and failures for a given period of time.

MAJOR ACTIVITIES:

1. Gathering Data (e.g. Heights, weights, and ages of students; re of test scores; enrollment; promotions; failures; etc.).
2. Arranging Data (e.g. From shortest to tallest student).
3. Writing frequency tally of the ungrouped data arranged.
4. Identifying and listing the mode (s) of the data
5. Computing the mean, median, and range of the ungrouped data

UNIT II: Counting Choices (Listing and Tree Diagrams)

OBJECTIVES:

The student will be able to construct tree diagrams of cross produc of sets.

MAJOR CONCEPTS/IDEAS TO BE DEVELOPED

Cross product of sets; tree diagrams.

INSTRUCTIONAL MATERIALS

Cut outs with letters, words, or one-digit numerals written on them; buttons of different colors; marbles; plain sheets of paper; pens; pencils, markers; colored chalk; deck of playing cards.

R ACTIVITIES:

1. Choosing pairs of objects, cutouts, cards, buttons, and marbles from a given set.

. Drawing pictures and then listing all the possible choices from the experiments performed.

3. Listing all possible ways in which the letters of given words can be arranged.
4. Listing all possible numerals that can be written, given a definite two or more digit numeral.
5. Writing cross products of sets.
6. Constructing tree diagram based on choices made and cross products of sets.

III: Optional

Games of Chance (Rolling a die; tossing a coin; making a selection of objects and spinning a probability spinner).

UCTIONAL MATERIALS

Dice; coins; probability spinners; marbles; beads; bottle caps; checkers of different colors; empty cans; plates or bowls; maggi cubes; buttons of different colors.

R CONCEPTS/IDEAS TO BE DEVELOPED

Sample space; event of a sample space; Probability of Event A ro B; Probability of Event A and B.

ECTIVES: Given Events A and B, student will be able to compute the Probability of A ro B and the Probability of A and B.

R ACTIVITIES:

1. Listing events of sample space obtained by performing simple experiments with various games of chance.
2. Naming sets of events using capital letters
3. Listing the sample spaces obtained by performing simple experiments using various games of chance.
4. Computing the probability of given events of the sample spaces constructed.
5. Computing the probability of two events e.g. P(A ro B) and P(A and B).

LIST OF SUGGESTED MATHEMATICS BOOKS TO BE USED IN IMPLEMENTING THE JUNIOR HIGH SCHOOL MATHEMATICS CURRICULUM

7th Grade

*1. Krause, Eugene F. and Brumfiel, Charles, MATHEMATICS I: CONCEPTS, SKILLS, AND APPLICATIONS, APPLICATIONS, Addison-Wesley Publishing Company, Menlo Park, Californa, 1975

*2. Stein, Edwin I., Practical Applications in Mathematics, Allyn and Bacon, Inc., Belmont, California, 1972.

**3. Stein, Edwin I, Stein's Refresher Mathematics With Practical Applications, Allyn and Bacon, Inc., Belmont, California, 1974.

**4. Jurgensen, Ray C et. al., Modern Basic Geometry, Boston, Houghton Mifflin Co., 1976.

**5. Brumfiel, Charles F. et. al., Arithmetic Concepts and Skills, Addison-Wesley Publishing Company, Reading, Massachusetts, 196[illegible]

**6. Sobel, Max A. and Malotskn, Evan M., Essentials of Mathematics. Ginn and Company, Upper Montclair, New Jersey, 1973.

8th Grade

*1. Krause, Eugene F. and Brumfiel, Charles, Mathematics II: Concepts, Skills, and Applications, Addison Publishing Company, Menlo Park, California, 1975.

*2. Stein, Edwin I., Practical Applications in Mathematics Allyn and Bacon, Inc., Belmont, California, 1972.

**3. Stein, Edwin I., Stein's Prefresher Mathematics With Practical Applications, Allyn and Bacon, Inc., Belmont, California, 1974

**4. Jurgenson, Ray C., et. al., Modern Basic Geometry, Boston, Houghton Mifflin Company, 1976.

**5. Brumfiel, Charles F. et. al., Basic Concepts of Mathematics, Addison-Wesley Publishing Company.

**6. Sobel, Max A. and Maletsky, Evan M., Essentials of Mathematics Ginn and Company, Upper Montclair, New Jersey, 1973.

[illegible] Grade

*1. Dolciani, Mary P. Et. al., Algebra, Structure and Method Book I, Houghton Mifflin Company, Boston, 1976.

*2. Jurgensen, Ray C., Et. al., Modern Basic Geometry, Boston, Houghton Mifflin Co., 1976.

*3. Stein, Edwin I., Stein's Refresher Mathematics, With Practical Applications, Allyn and Bacon, Inc. Belmont, California, 1974.

**4. Jacobs, Russel F., Introductory Algebra I, Second Edition, Harcourt Brace Jovenovich, Inc., New York, 1973.

**5. Stein, Edwin I., Practical Applications in Mathematics, Allyn and Bacon, Inc., Belmont, California, 1972.

**6. Sobel, Max A. and Maletsky, Evan M., Essentials of Mathematics 3, Ginn and Company, Upper Montclair, New Jersey, 1973.

E: * - Recommended Textbook
** - Supplementary Book.

GOAL OF A MATHEMATICS PROGRAM FOR THE SENIOR HIGH SCHOOL OF LIBERIA

It is well known that a sizeable number of our students terminate their formal education at the end of the ninth grade. Of those who complete high school perhaps only 50% go to College; the rest find employment on the job market. Our mathematics program should therefore be directed towards three distinct groups;

1. Those who terminate their formal education at the end of the Junior High School
2. Those who go on to senior high school but terminate their formal education at the end of grade 12.
3. Those who go on to college.

The mathematics program for the senior high school should be geared towards the following broad objectives:

a) To give the students a broader view in the field of mathematics that will enable them to pursue higher studies in mathematics and other related fields.

b) To give the students the mathematical information and skills most likely to be useful to them in their vocational pursuits in the civil service as well as in private industry. The information and skills acquired here should enable the students to operate more effectively and on a higher plane than the junior high school leavers.

THE JUNIOR AND SENIOR HIGH SCHOOL SCIENCE CURRICULUM

Part I: General Structural Objectives

The Junior and Senior High School Science Curriculum has been written in order to maximize teaching and learning by having the students deal with the three sciences - biology, chemistry, and physics at different depths. With this in mind, the students will be able to persue any career of his/her choice in any of the sciences, and will not feel that that he/she has not been adequately prepared. New topics such as Health and Agriculture have been encoorporated in the science curriculum.

The instructional materials have been carefully formulated and arranged for General Science to be taught five times a week and for Senior High seven times a week. It is our desire that those schools with 30 teaching hours per week will find ways and means to implement this curriculum for the students to get the maximum results.

1. Junior High General Science - (7, 8 and 9) should be taught five times per week.

2. Senior High School Science Program includes biology, chemistry and physics, these should be taught in 10, 11 and 12 grades.

Emphasis is placed on each of the sciences at different grade level.

1. Grade 10
    a. Biology 3 hours per week (emphasis is on biology)
    b. Chemistry 2 hours per week
    c. Physics 1 hour per week

2. Grade 11
    a. Chemistry 3 hours per week (emphasis is on Chemistry)
    b. Physics 2 hours per week
    c. Biology 1 hour per week

3. Grade 12

a. Physics 3 hours per week (emphasis is on Physics)
b. Biology 2 hours per week
c. Chemistry 1 hour per week

Important. One hour should be allotted each week for laboratory work.

The objectives of this Science Curriculum is concerned with the great ideas that contribute to our understanding of how our country and the rest of the world function: Genetic continuity, fighting diseases, evolution, and conservation of matter and energy. For example, an understanding of these principles leads to the production of more rice, better cows, better fertilizers, and better machines. But for more significant, educationally, it is the fact that they lead to a conceptual knowledge of the biological, chemical and physical world that is our home. In terms of the physical, chemical and biological content, the students should be able to recapitulate the process by which knowledge is gained in the place, rather than merely absorbing what they are told by books and teachers. Thus not learning the laws and principles of science, but the evidence upon which they are based and their limitations.

JUNIOR HIGH SCHOOL SCIENCE CURRICULUM

INSTRUCTIONAL OBJECTIVES

PART I

The Junior High Science Curriculum has been written for grades 7, 8 and 9 for a three-year period. Emphasis is placed on the following areas:

1. Scientific knowledge
2. Matter - Non-living and living
3. Energy
4. Earth science and space
5. Health
6. Agriculture

It is the Ministry's hope that the students will make the maximum study of these topics and that practical experiences and field trips be incorperated as much as possible.

Upon completion of this course of study the students should be able to demonstrate knowledge and understanding of the General Principles of Science which are implicated in the following criteria:

1. Understand the scientific concept of knowledge.
2. Identify the principles associated with the seicntific method of thinking and problem solving.
3. Understand the basic interdependence in Ecology and the importance it holds for human survival.
4. Recognize the fundamental structures of the cell and understand the cell as the basic unit of living things.
5. Understand the basic groupings of plants and describe the fundamental structures and functions of seed plants.
6. Understand the basic groupings of animals and describe the fundamental structures of the most common examples of individual phylum.
7. Describe the fundamental structures and functions of the human body and understand the necessity of a balanced diet for good health.
8. Evolution as continuity and change in living things.
9. Understand good health habits and needs of the body.
10. Understand the foundamentals of agriculture and how it can help to produce more food for individual consumption.

11. To understand and be able to explain the difference between elements, compounds and mixture which are the natural form of all matter.

12. To be able to name the three main kinds or classes of rocks and to name some common rocks found in each class.

13. To have a general understanding on how the lithosphere was forme

14. To realize that the lithosphere is constantly undergoing a change and what effects the hydrosphere and atmosphere have on the lithosphere.

15. To be able to describe what causes the weather to change and why we have different climates in various parts of the lithosphere.

16. To understand why the principles of conservation are becoming more important than ever before and how we can conserve energy and our natural resources.

17. To be able to name some of the more important planets and stars in our galaxy and what affect if any they have on the earth.

18. Understand that light, heat, sound and electricity are forms of energy andidentify their uses.

19. Understand the principles associated with simple machines.

20. Understand the basic characteristics of mater.

21. Understand the principles of conservation.

22. Understand the concepts and affects of magnitism.

JUNIOR HIGH GENERAL SCIENCE

SYLLABUS

GRADE SEVEN

TOPICS: Instructional Items to be Emphasized:

I. Scientific Knowledge:

1. Facts that we know and can explain constitute knowledge.
2. Scientific Method - Attitudes, observation and experimentation.
3. Measurement - English and Metric.
4. Science and Superstition.

II. Matter:

A. Non-Living Matter:

1. Characteristics and examples.
2. Structure of Elements (elementary treatment) compounds and mixture.
3. States of matter - solid, liquid and gas.
4. Changes - physical and chemical.
5. Fuels: Formation, kinds and uses (wood, kerosene, coal, etc).

B. Living Matter:

Characteristics of living things.

1. Plants:
   - a. Plants and their uses
   - b. Groups of plants - Flowering and non-flowering
   - c. Parts of a plant and functions
   - d. Structure and function of a flower (use the hibiscus plant)
   - e. Plant Life - growth, photosynthesis and reproduction
2. Animals:
   - a. Animals and their uses
   - b. Groups of animals (Invertebrates and vertebrates) - general characteristic of each group-similarity and differences

     *(Study a member of each class of vertebrates external parts and function; fish, toad or frog, lizard, rice bird or chicken, man-system of the human body and function, elementary treatment).
3. Comparison of Plants and Animals (elementary treatment)

316

III. Energy:

1. General characteristics and kinds of energy.
2. Potential and kenetic, heat, light sound, electrical, chemical, radiant or solar, nuclear and mechanical.
3. Six simple machines, force, work, problems on work - simpl energy and power.

IV. Health:

1. Definition of health; yourself - appearence and good health habits.
2. Foods-definition of foods - types, sources deficiency and diseases; air, water and physical exercises.
3. The effects of drugs on the body - tobacco, opium, marijuana, alcohol and others.
4. Common diseases - malaria, dysentery, diseases caused by worms - type of worms.

V. Earth Science and Space:

1. The Earth - Zones of the earth:
    a. The atmosphere - air pressure; weather and climate - kinds, causes and affect of air masses on weather.
    b. The Hydrosphere
        1. Water - types of water (fresh and salt)
        2. Sources and uses
    c. Lithosphere - Formation of the earth
        1. Forces of nature affecting the shape of the earth - volcano, earthquakes, wind, water, glacier, etc.
        2. Layers of the earth-crust, mantle and core.
        3. Types of rocks - igneous, sedimentary and metamor
        4. Formation of rocks.
        5. Soil-formation, types, uses and conservation.
        6. Minerals of the earth (emphasis placed on one found in Liberia).
2. Space:

    The Universe

    1. The solar system
    2. The sun and planets
    3. Rotation and Revolution - Time
    4. Stars, Constellation and Galaxies
    5. Instruments used to study the heavenly bodies (eg. telescope, spectroscope, etc).
    6. Space travel - short history of flight, survival in space and reaching the moon.

VI. Agriculture:

1. Definition of agriculture
2. Preparation of soil for growing plants
    a. Germination and growth of seeds
    b. weeding
3. Uses of fertilizers
4. Destroyers of plants-pests, insects and rodents, etc.

SCOPE AND SEQUENCE ANALYSIS OF INSTRUCTIONAL TOPICS

JUNIOR HIGH SCIENCE GRADE 7

First Semester

First Period

Unit I

I. Scientific Knowledge:

a. Facts that we know and can explain constitute knowledge.

b. Scientific Method

1. Attitudes
2. Observation
3. Experimentation

c. Measurement

1. English) conversion
2. Metric)

d. Science and Superstition

Unit II

II. Matter:

A. Non-living Matter

1. Characteristics and examples of matter
2. States of matter - solids, liquids and gases
3. Structure (elementary treatment) of element, compou
   and mixture
4. Changes - physical and chemical
5. Fuels; kinds, formation and uses

Second Period

B. Living Matter

1. Characteristics of living things (examples of all
   and little explanation of each group).
2. Plants:
   a. Plants and their uses
   b. Group of plants - non flowering and flowering
   c. Parts of a plant and function (leaves, stem,
   d. Structure and function of a flower (use the h
   plant)
   e. Plant life - Growth, photosynthesis and repr

3. Animals

  a. Animals and their uses
  b. Groups of animals (invertebrates and vertebrates)

  General characteristics of each group - similarity and difference

  (Study a member of each class of vertebrates) external parts and fuction) - fish, toad or frog, lizard, rice birds or chicken

  Man - systems of the human body and function (elementary treatment)

4. Comparison of plants and animals

Third Period

Unit III

III. Energy:

  A. General characteristic of energy with examples.

  Kinds of energy:

  1. Potential and kenetic
  2. Heat, light, sound, chemical, electrical, radiant, solar, nuclear and mechanical - discuss
  3. Force, work, energy and power (simple problems involving work only) - discuss
  4. Simple machines (six) - functions

Second Semester

Fourth Period

Unit IV

IV. Health:

  A. Health - definition (examples of good health)

  1. Yourself - appearance
  2. Good health habits

  B. Needs of the Body:

  1. Foods - definition of foods
  2. Types of foods and sources
  2. Deficiency and diseases
  3. Air and function
  4. Water and physical exercises

  C. The effect of drugs on the body - tobacco, opium, marijuana, alcohol and others.

  D. Common diseases - malaria, dysentery and diseases caused worms (study common intestinal worms).

Fifth Period

Unit V

V. Earth Science and Space:

- A. The Earth:

  Zones of the Earth

  - 1. The Atmosphere
    - a. Air pressure
    - b. Weather and climate

      Kinds and causes of weather
      Effect of air masses on weather
  - *2. The Hydrosphere:

    Water (fresh and salt) sources and uses
  - 3. Lithosphere:
    - a. Formation of the earth
    - b. Forces of nature affecting the shape of the earth- earthquakes; wind; water; glacier, etc.
  - 4. Layers of the earth-crust, mantle and core
  - 5. Types of rocks-igneous, sedimentary and metamorphic
  - 6. Formation of rocks
  - 7. Soil-formation, types and conservation
  - 8. Minerals of the earth (emphasis placed on ones found Liberia)
- B. Space:
  - 1. The universe
  - 2. The solar system - the sun and the planets
  - 3. Rotation and revolution - time
  - 4. The stars - constellation and galaxies
  - 5. Instruments used to study the heavenly bodies
  - 6. Space Travel-History of flight
    - a. Survival in space
    - b. Reaching the moon

Sixth Period

Unit VI

VI. Agriculture:

- a. Agriculture - definition and examples
- b. Preparation of soil for growing plants
- c. Germination and growth of seeds
- d. weeding
- e. Uses of fertilizers
- f. Destroyers of plants - pests, insects, rodents, etc.

JUNIOR HIGH GENERAL SCIENCE

SYLLABUS

GRADE EIGHT

TOPICS: Instructional Items to be Emphasized:

I. Scientific Knowledge:

1. Common sense as a source of knowledge
2. How scientists solve problems
3. The nature of scientist
4. Measurement - basic and derived

II. Matter:

A. Non-Living Matter

1. The structure of matter - states of matter and characteristics
2. Elements - definition, some common elements and symbols
3. Compounds - definition, common ones and formulas
4. Mixture - examples
5. Comparison of elements, compound and mixtures

B. Living Matter:

1. Plants:
   - a. Classification of plants - characteristics of each group (Algae, Fungi, Mosses, Ferns, Cone-bearing and Flowering)
   - b. Plant life - needs of plants
   - c. Plant cell - structure
   - d. Respiration and photosynthesis
   - e. Types of plants according to environment
   - f. Types of roots - Tape root and fibrous
   - g. Types of leaves
     1. Simple and compound
     2. Shape of leaves and arrangement on stem
   - h. Flowers - parts, pollenation (self and cross)
2. Animals:
   - a. Classification of animals - characteristies of each group
   - b. Study Anthropoda with special emphasis on class insecta or insects

c. Human Body:

(Study some systems) Respiratory, Circulatory, Digestive and Skeletae - elementary treatment.

III. Energy:

1. Definition of energy
2. Forces in the environment - gravity, inertia, friction, cohesion and adhesion
3. Energy - Potential and Kinetic
4. Forms of energy - Mechanical, Heat, Light, Chemical, Sound, Electrical, Atomic and Solar
5. Sources and uses of energy
6. Fuels - Kinds and uses
7. Machines and their work - simple machines; simple problems on simple machines

IV. Health:

1. The Human Body and how it works
2. Some sense organs - the Eye, the Ear and the Nose, and their care
3. Diseases - communicable and non-communicable, occurence, prevention and cure
4. Safety in the Home and School

V. Earth and Space Science:

1. The earth - sphere of the earth:

   The Atmosphere

   1. Water vapour
   2. Precipitation and kinds
   3. Heat in the air
   4. Air pressure
   5. Weather and climate
   6. Winds kinds
   7. Conditions influencing climate

2. The Hydrosphere:

   a. Water - properties

      1. Distribution and supply of water
      2. Purification of water

   b. The Ocean

      1. Currents and tides

3. The Geosphere:

   a. The earth crust
   b. Minerals in the earth
   c. Comparison of types of rocks

4. Space:

   a. Review the solar system
   b. Theories about space
      (Requirement for space travel)
   c. Our moon and its affect upon the earth-tides
   d. Early space travelers

VI. Agriculture:

1. Types of soil and fertilizers
2. The effect of soil and fertilizers on the growth of. plants

SCOPE AND SEQUENCE ANALYSIS
OF INSTRUCTIONAL TOPICS

JUNIOR HIGH SCIENCE -GRADE 8

First Semester

First Period

Unit I

I. Scientific Knowledge
   - a. Common sense as a source of knowledge
   - b. How scientists solve problems
     - 1. The nature of scientists
   - c. Measurements:- basic and derived (English, Metric and SI Units)

Unit II

II. Matter

The structure of matter

1. States of matter and characteristics

A. Non-Living Matter

1. Elements - definition
   - a. Some common elements and symbols
2. Compounds - definition
   - a. Common ones and formulas
3. Mixture - definition and examples
4. Comparison of elements, compounds and mixture

Second Period

B. Living Matter

1. Plants
   - a. Classification of plants - characteristic of each group. (Algae, Fungi, Mosses, Ferns, Cone-bearing and Flowering)
   - b. Plant life - needs of plants
   - c. Plant cell - structure
   - d. Respiration and photosynthesis
   - e. Types of plants according to environment
   - f. Types of roots - Tap and Fibrous
   - g. Type of leaves - simple and compound
     - a. Shapes of leaves and arrangement on stem
   - h. Flowers - parts; pollenations - self and cross

2. **Animals**

   a. Classification of animals - characteristics of each group

   b. Study phylum Arthropoda with special emphasis on Class Insecta

3. **The Human Body**

   (Study some systems) Respiratory, Circulatory, Skeletal and Digestive - elementary treatment

Third Period

Unit III

III. Energy

a. Energy - definition

b. Forces in the environment - gravity, inertia, friction, cohesion and adhesion

c. Energy - Potential and Kinetic

d. Forms of energy - sources and uses of energy

   1. Mechanical, Heat, Chemical, Sound, Electrical atomic and Solar

e. Fluids - Kinds and uses

f. Machines and their work - simple machines

   a. Simple problems involving simple machines

Second Semester

Fourth Period

Unit IV

IV. Health

a. The human body and how it works

b. Some sense organs - Eye, Ear, Nose and how to take care of them

c. Diseases - communicable and non-communicable, occurence, prevention and cure

d. Safety in the Home and School

Unit V

V. Earth and Space Science

A. The Earth:- Spheres of the earth

   1. The Atmosphere:

      a. Water vapour
      b. Precipitation and kinds

- c. Heat in the air
- d. Air pressure
- e. Weather and climate
    - 1. Winds - kinds
    - 2. Weather
    - 3. Condition influencing climate

2. The Hydrosphere
    - a. Water - properties
    - b. Distribution and supply of water
      Purification of water
    - c. The ocean:
        - 1. Currents and tides

Fifth Period

3. The Geosphere
    - a. The earth's crust
    - b. Minerals in the earth (identification)
    - c. Comparison of types of rocks

B. Space

1. Review the solar system - sun, stars, etc.
2. Theories about space
3. Satellites - natural and man-made
4. Our moon and its affect upon the earth-tides
5. Early space travelers

Sixth Period

Unit VI

VI. Agriculture

- a. Types of soils
- b. Fertilizers
- c. Effect of soils and fertilizers on growth of plants.

JUNIOR HIGH GENERAL SCIENCE SYLLABUS

GRADE NINE

TOPICS: Instructional Items to be Emphasized

I. Scientific Knowledge:

1. Man and the scientific methods of solving problems
2. The scientific method of study
3. Difference between science and technology
4. The aid of mathematics in describing things - qualititive and quantitive
5. Measurements - English, Metric and the SI Units.

II. Matter

Matter - definition and examples of all types

A. Non-Living Matter

1. Elements - Atom and its structure
2. Classification of elements (elementary treatment)
3. Compounds, chemical changes and molecules
    - a. Compounds - Acids, bases and salts
4. Mixture - (examples air and sea water)
5. Difference between elements compound and mixture

B. Living Matter

1. Characteristics common to all living things
2. Comparison of plants and animals
3. Reproduction in living things Asexual and Sexual
4. Inherited Traits
    - a. Transmission of traits
    - b. Mendel's experiment and laws of heredity
    - c. Cell division (elementary treatment) and heredity
    - d. Chromosomes and D N A
5. Plant Kingdom:
    - a. Groups of plants (Algae and Fungi; mosses; ferns; seed-bearing)
    - b. Characteristics of each group
    - c. Parts of plants and functions
        1. Roots - types
        2. Stem - types (woody and Herbaceous)
           Study cross section of a stem.
        3. Leaves - types; external and internal anatomy.

d. Importance of plants:
    1. Food, clothings medicine etc.
    2. Harmful plants
    3. Plants diseases and control
    4. Conservation

6. Animal Kingdom:

    a. Groups of animals - Invertebrates and Vertebrates

        1. Invertebrates - One-celled or protozoa, the sponges, jellyfish etc., flatworms, roundworms and earthworms; Animals with soft bodies - snail etc; Spiny-skinned - starfish; Animals with jointed legs - grasshopper etc.

        2. Vertebrates - Fishes; Amphibians; Reptiles; Birds and Mammals. (characteristics of each group)

7. Importance of Animals:

    a. Protection of animals

8. The Human Body:

    a. Structure of the body

    b. The systems and their functions - skeletal; Digestive; Respiratory; Circulatory and Transport; Excretory, Nervous (endocrine glands)

III. Health

1. The care of the body:

    a. Reasons for eating

    b. Foods - various food groups and functions

    c. Weight control - proper, over and under weights

    d. Air - function

    e. Medicine - control of diseases

    f. Need for physical exercises

2. The effects of Alcohol, Narcotics and Drugs on the Body.

3. First Aid:

    a. Definition of first aid

    b. Treatments of shots, burns, bleeding, bites, cuts etc.

    c. Artificial Respiration (discussion and demonstration)

JUNIOR HIGH GENERAL SCIENCE SYLLABUS

GRADE NINE

TOPICS: Instructional Items to be Emphasized

I. Scientific Knowledge:

1. Man and the scientific methods of solving problems
2. The scientific method of study
3. Difference between science and technology
4. The aid of mathematics in describing things - qualititive and quantitive
5. Measurements - English, Metric and the SI Units

II. Matter

Matter - definition and examples of all types

A. Non-Living Matter

1. Elements - Atom and its structure
2. Classification of elements (elementary treatment)
3. Compounds, chemical changes and molecules
    - a. Compounds - Acids, bases and salts
4. Mixture - (examples air and sea water)
5. Difference between elements compound and mixture

B. Living Matter

1. Characteristics common to all living things
2. Comparison of plants and animals
3. Reproduction in living things Asexual and Sexual
4. Inherited Traits
    - a. Transmission of traits
    - b. Mendel's experiment and laws of heredity
    - c. Cell division (elementary treatment) and heredity
    - d. Chromosomes and D N A
5. Plant Kingdom:
    - a. Groups of plants (Algae and Fungi; mosses; ferns; seed-bearing)
    - b. Characteristics of each group
    - c. Parts of plants and functions
        1. Roots - types
        2. Stem - types (woody and Herbaceous) Study cross section of a stem.
        3. Leaves - types; external and internal anatomy.

d. Importance of plants:

1. Food, clothings medicine etc.
2. Harmful plants
3. Plants diseases and control
4. Conservation

6. Animal Kingdom:

a. Groups of animals - Invertebrates and Vertebrates

1. Invertebrates - One-celled or protozoa, the sponges, jellyfish etc., flatworms, roundworms and earthworms; Animals with soft bodies - snail etc; Spiny-skinned - starfish; Animals with jointed legs - grasshopper etc.

2. Vertebrates - Fishes; Amphibians; Reptiles; Birds and Mammals. (characteristics of each group)

7. Importance of Animals:

a. Protection of animals

8. The Human Body:

a. Structure of the body

b. The systems and their functions - skeletal; Digestive; Respiratory; Circulatory and Transport; Excretory, Nervous (endocrine glands)

III. Health

1. The care of the body:

a. Reasons for eating

b. Foods - various food groups and functions

c. Weight control - proper, over and under weights

d. Air - function

e. Medicine - control of diseases

f. Need for physical exercises

2. The effects of Alcohol, Narcotics and Drugs on the Body.

3. First Aid:

a. Definition of first aid

b. Treatments of shots, burns, bleeding, bites, cuts etc.

c. Artificial Respiration (discussion and demonstration)

JUNIOR HIGH GENERAL SCIENCE SYLLABUS

GRADE NINE

TOPICS: Instructional Items to be Emphasized

I. Scientific Knowledge:

1. Man and the scientific methods of solving problems
2. The scientific method of study
3. Difference between science and technology
4. The aid of mathematics in describing things - qualititive and quantitive
5. Measurements - English, Metric and the SI Units

II. Matter

Matter - definition and examples of all types

A. Non-Living Matter

1. Elements - Atom and its structure
2. Classification of elements (elementary treatment)
3. Compounds, chemical changes and molecules
    a. Compcunds - Acids, bases and salts
4. Mixture - (examples air and sea water)
5. Difference between elements compound and mixture

B. Living Matter

1. Characteristics common to all living things
2. Comparison of plants and animals
3. Reproduction in living things Asexual and Sexual
4. Inherited Traits
    a. Transmission of traits
    b. Mendel's experiment and laws of heredity
    c. Cell division (elementary treatment) and heredity
    d. Chromosomes and D N A
5. Plant Kingdom:
    a. Groups of plants (Algae and Fungi; mosses; ferns; seed-bearing)
    b. Characteristics of each group
    c. Parts of plants and functions
        1. Roots - types
        2. Stem - types (woody and Herbaceous) Study cross section of a stem.
        3. Leaves - types; external and internal anatomy.

d. Importance of plants:

1. Food, clothings medicine etc.
2. Harmful plants
3. Plants diseases and control
4. Conservation

6. Animal Kingdom:

a. Groups of animals - Invertebrates and Vertebrates

1. Invertebrates - One-celled or protozoa, the sponges, jellyfish etc., flatworms, roundworms and earthworms; Animals with soft bodies - snail etc; Spiny-skinned - starfish; Animals with jointed legs - grasshopper etc.

2. Vertebrates - Fishes; Amphibians; Reptiles; Birds and Mammals. (characteristics of each group)

7. Importance of Animals:

a. Protection of animals

8. The Human Body:

a. Structure of the body

b. The systems and their functions - skeletal; Digestive; Respiratory; Circulatory and Transport; Excretory, Nervous (endocrine glands)

III. Health

1. The care of the body:

a. Reasons for eating

b. Foods - various food groups and functions

c. Weight control - proper, over and under weights

d. Air - function

e. Medicine - control of diseases

f. Need for physical exercises

2. The effects of Alcohol, Narcotics and Drugs on the Body.

3. First Aid:

a. Definition of first aid

b. Treatments of shots, burns, bleeding, bites, cuts etc.

c. Artificial Respiration (discussion and demonstration)

383

V. Energy

1. Energy and machines

- a. Forces, motion and energy - force - definition and application of force
- b. Inertia, speed and acceleration
- c. Action and Reactions
- d. Work - definition and problems
- e. Potential energy
- f. Kinetic energy
- g. Machines and uses
    - 1. Kinds of simple machines
    - 2. Bernoulli's principle (fluid)

2. Heat and Temperature

- a. Measurement of temperature - thermometer scales
- b. Effects of heat change
- c. Methods of heat transfer and applications
- d. Fire control
- e. Principles of heat engines

3. Wave Energy

- a. Sound -
    - 1. Production and transmission of sound waves
    - 2. Characteristics of sound
    - 3. Audibility range
    - 4. Sources of musical sounds and musical instruments

4. Light

- a. Speed, transmission, shadows and images
- b. Reflection and refraction of light
- c. Types of mirrors, lenses and their uses
- d. Measuring light. Cause of color

5. Electrical Energy

- a. Static electricity - effects
- b. Current electricity - sources and measurement
- c. Relation of chemical and electrical energy
- d. Types of magnets
- e. Uses of electromagnets - Electric bell, Telegraph and Telephone

V. Earth Science and Space

1. The Earth

a. The Atmosphere:

1. Air pressure and its effects
2. Measuring air pressure
3. Bernoullus principle as applied to flight

b. Weather and Climate:

1. Causes of air movements
2. Forms of moisture - visable and invisable
3. Air masses and effect upon weather
4. Force casting weather changes
5. Climate - types of climate
6. Factors that influence different types of climate
7. Controlling the climate - sun and climate

c. Latitude, Longitude, Temperature and Altitude

d. The Hydrosphere:

1. Properties of water - adhesion, cohesion and surface tension
2. Putting fluid pressure to work - Hydrolic machines
3. Water pressure, water wheels and dams construction
4. Bouyancy - Determing density and specific gravity of liquids and solids. Problems involving specific gravity and density
5. Our water supply - water cycles, water table, sources of water and transporting of water
6. Methods of purfying water
7. Water as a solvent - soft and hard water
8. Septic and sewer disposal, city sewer system
   The water meter
9. The Ocean:
   a. Beneath the ocean surface
   b. Patterns of seas
   c. Types of waves
   d. Ocean current and winds. Currents and counter
   e. Tides - causes, types and importance

e. Geosphere:

  a. The surface of the earth - mapping the earth's surface, types of maps.

  b. Forces affecting changes on the earth's surface

    1. Breaking down - weathering, erosion, glacier
    2. Building up - volcano, mountain and earthquakes

  c. Structure of the earth - exterior (Hills, mountain, valleys, plains, the core and mantle)

  d. Identifying minerals in the earth

  e. Types of rocks - the rock cycle

  f. History of the earth crust

2. Space

  1. The earth, moon and sun - relationship

  2. The moon-surface and life

  3. Eclipse - causes, solar and lunar exlipse

  4. The solar system - planets, comets, meteroids and shotting stars

  5. Beyond the solar system
     a. Tools of astronomy

  6. Problems of space travel

3. Agriculture

Farming -

Definition

Kinds of farms

  a. Family farms
  b. Commercials farms

(Discuss farms in Liberia private and Government)

SCOPE AND SEQUENCE ANALYSIS OF INSTRUCTIONAL TOPICS

JUNIOR HIGH SCIENCE - GRADE 9

First Semester

First Period

Unit I

I. Scientific Knowledge

- a. Man and the scientific methods of solving problems
- b. The scientific method of study
- c. Difference between Science and Technology
- d. The aid of Mathematics in describing things - qualititive and quantitive
- e. Measurements - English metrics and the SI Units

Unit II

II. Matter

Matter - definition and examples of all types

A. Non-Living Matter:

1. Elements - Atom and its structure .
2. Classification of elements
3. Compounds, chemical changes and molecules
    - a. Compounds - Acids, bases, and salts
4. Mixture - (examples, air and sea water)
5. Difference between elements, compound and mixtures

Second Period

Unit 3

B. Living Mater:

1. Characteristics common to all living things
2. Comparison of plants and animals
3. Reproduction in living things - Asexual and Sexual
4. Inherited Traits
    - a. Transmission of traits
    - b. Mendel's experiment and laws of heredity
    - c. Cell division (elementary treatment) and heredity
    - d. Chromosomes and D N A

5. **Plant Kingdom:**

   a. Groups of plants (Algae and Fungi; Mosses; Ferns; Seed-Bearing)

   b. Characteristics of each group

   c. Parts of plant and functions

      1. Roots - types
      2. Stems - types (Woody and Herbaceous Study cross section)
      3. Leaves - types, external and internal anatomy

   d. Importance of plants

      1. Foods, clothing, medicine, etc.
      2. Harmful plants
      3. Plants diseases and control
      4. Conservation

6. **Animal Kingdom:**

   a. Groups of Animals - vertebrates and Invertebrates

      1. Invertebrates:-

         One-cell or protozoa; the sponges; jellyfish etc.
         Flatworms, roundworms, and earthworms,
         Animals with soft bodies-snail etc.
         Spiny-skinned - starfish; animals with jointed legs - grasshopper etc.

      2. Vertebrates - Fishes; Amphibians; Reptiles; Birds and Mammals. (characteristics of each group).

7. **Importance of Animals**

   a. Protection of animals

Unit IV

8. **The Human Body:**

   a. Structure of the body

   b. The systems and their functions - Skeletal; Digestive; Respiratory, Circulatory and Transport. Excretory, Nervous (endocrine glands)

Third Period

Unit V

III. Health

- A. The care of the body
  - 1. Reasons for eating
  - 2. Foods - various food groups and functions
  - 3. Weight control - proper, over and under weights
  - 4. Air - function
  - 5. Medicine - control of diseases
  - 6. Need for physical exercises
- B. The effects of alcohol, narcotics and drugs on the body
- C. First Aid
  - 1. Definition of First Aid
  - 2. Treatments of shots, burns, bleeding, bites, cuts etc.
  - 3. Artificial Respiration (discussion and demonstration)

Second Semester

Fourth Period

Unit VI

IV. Energy

- A. Energy and Machines
  - 1. Forces, motion and energy - force - definition and application of force
  - 2. Inertia, speed and acceleration
  - 3. Action and Reactions
  - 4. Work - definition and problems
  - 5. Potential energy
  - 6. Kinetic and uses
  - 7. Machines and uses
    - a. Kinds of simple machines
    - b. Mechanical advantage of simple machines
  - 8. Fluids and Work
    - a. Force and pressure
    - b. Bernoulli's principle (fluid)

B. Heat and Temperature
  1. Measurement of temperature - thermometer scales
  2. Effects of Heat change
  3. Methods of heat transfer and applications
  4. Fire control
  5. Principles of heat engines

C. Wave Energy
  1. Sound -
    a. Production and transmission of sound waves
    b. Characteristics of sound
    c. Audibility range
  2. Sources of musical sounds and musical instruments

D. Light
  1. Speed, transmission, shadows, images
  2. Reflection and refraction of light
  3. Types of mirrors, lenses and their uses
  4. Measuring light, cause of color

E. Electrical Energy
  1. Static electricity - effects
  2. Current electricity - effects measurement
  3. Relation of chemical and electrical energy
  4. Type of magnets
  5. Uses of electromagnets - Electric bell, Telegraph and Telephone

Fifth Period

Unit VII

I. Earth Science and Space

A. The Earth
  1. The atmosphere:
    a. Air pressure and its effects
    b. Measuring air pressure
    c. Bernoullus principles as applied to flight
  2. Weather and Climate
    a. Causes of air movements
    b. Forms of moisture - visible and invisible
    c. Air masses and effect upon weather
    d. Forecasting weather changes
    e. Climate - types of climate
    f. Factors that influence different types of climate
    g. Controlling the climate - sun and climate

3. Latitude, Longitude, Temperature and Altitude
4. The Hydrosphere:
    - a. Properties of water - adhesion, cohesion and surfa tension
    - b. Putting fluid pressure to work - Hydrolic machine
    - c. Water pressure, water wheels and dams constructio
    - d. Bouyancy -Determining density and specific gravity of liquids and solids. Problems involving specifi gravity and density
    - f. Methods of purifying water
    - g. Water as a solvent - soft water and hard water
    - h. Septic and sewer disposal city sewer system
The water meter
    - i. The Ocean -
        1. Beneath the ocean surface
        2. Patterns of seas
        3. Types of waves
        4. Ocean current and winds, currents and counter currents.
        5. Tides - causes, types and importance
5. Geosphere:
    - a. The surface of the earth, mapping the earth's surface types of maps
    - b. Forces affecting changes on the earth's surface
        1. Breaking down - weathering, erosion, glacier
        2. Building up - volcano, mountain and earthquak
    - c. Structure of the earth - exterior and interior (Hills, mountains, valleys, plains, the core and mantle).
    - d. Identifying minerals in the earth
    - e. Type of rocks - the rock cycle
    - f. History of the earth's crust

Unit VIII

Period

B. Space

1. The earth, moon and sun - relationship
2. The moon - surface and life
3. Eclipses- causes, solar and lunar eclipses
4. The solar system - planets, comets, meteroids and shooting stars
5. Beyond the solar system
    a. Tools of astronomy
6. Problems of space travel

riculture

Farming:

1. Definition
2. Kinds of farms
    a. Family farms
    b. Commercial farms

JUNIOR HIGH SCHOOL

1.00 TEXTS

1.01 Junior Biology 1 & 2
By: H.J. Savory
T. Nelson Publishing Company, London

1.02 Science I, Observation & Experiment
By: Ira C. Davis, John Burnett, E. Wayne Gross
& L. Brenton Prichard.

Holt, Rinehart & Winston, Inc., New York

1.03 Junior Science 1 & 2
By: A.J. Southgate & L.E. Fovyi
T. Nelson Publishing Company, London

1.04 Science 2, Experiment & Discovery
By: Ira C. Davis, John Burnett, E. Wayne Gross
& L. Brenton Prichard.

1.05 General Science: A Course in Junior Science
By: H. Creaser, Longman, London

1.06 Science 3, Discovery & Progress
By: Ira C. Davis, John Burnett, E. Wayne Gross
& Johnson.

Holt, Rinehart and Winston, Inc., New York

1.07 Junior High School Biology *
By: Emett Denis, Aloysius Hanson & Dickson Reed.

2.00 READING AND REFERENCES

2.01 THE MACMILLIAN SCIENCE SERIES - Science:
A Search For Evidence Science:
A Way To Solve Problems and Science:
A Key To The Future

2.02 LONGMAN SERIES - Complete Junior Physics
By: A. Atkinson
Complete Junior Chemistry
By: A. Atkinson
Junior Tropical Biology
By: R.R. Johnson & A. Godman
* Text not yet published or incomplete.

PART III

SENIOR HIGH SCHOOL BIOLOGY CURRICULUM

A. INSTRUCTIONAL OBJECTIVES

The Senior High School Biology Objectives cover a Biology Course Work over a three years period at the 10th, 11th, and 12th grade levels. Upon completion of this Course of Study the Student should be able to demonstrate knowledge of the general principles associated with the Nature and Continuity of Livingthings, Microbiology, Multicellular Plants, Biology of Invertebrates, Biology of the Vertebrates and the Biology of Man as pointed out according to the following criteria.

1.00 Understand the basic principles associated with the Science of Life including living conditions, the diversity of life, principles of Heredity, Cell Growth and Reproduction, Photosynthesis, Respiration, Protein Synthesis and the Chemical Basis of Life.

1.01 Understand the importance of biological knowledge in our everyday living.
1.02 Identify problems and understanding the problems involved in the survival of livingthings.
1.03 Demonstrate how the microscope works.
1.04 Understand the Nature of Protoplasm and its organization in living cells.
1.05 Understand and describe the basic structure of Matter, Elements, Compounds, Chemical Changes, and the relation of livingthings to their chemical surroundings.
1.06 Understand and describe the chemical activity of the Green Plant as the link between the inorganic chemical world and the world of organic compounds and biochemical processes
1.07 Understand the principles associated with the role of the DNA Molecule as a determiner of heredity.
1.08 Describe Mitosis pointing out that it is a process in which two daughter cells receive identical chromosome and gene content from the mother cell, thus presefving the hereditary qualities of an organism and making it alike in all of its cells.
1.09 Describe Meiosis in Oogenesis and Supermatogenesis and the chance distribution of chromosome of genes, resulting in variation.
1.10 Understand the characteristics transmitted from parents to children.
1.11 Analyze and describe the laws and principles of heredity pointing methods use in controlling inheritance in Plants and Animals.

Identify Virus, Bacteriak Protozoans, Fungi and Algae pointing out the disease producing Viruses, Bacteria, Protozoans and Fungi and their control.

2.01 The students should be able to describe the Composition, Structure, reproduction of Viruses, Bacteria and Fungi.

BEST COPY AVAILABLE

2.02 Demonstrate the methods used in investigating Microorganisms

2.03 Identify the various ways by which infectious Organisms spread from one person to another.

2.04 Distinguish which Bacteria and Fungi are harmful, harmless, or beneficial.

2.05 Understand the Ministry of Healths measures in the prevention of disease and the role of the average person in helping to carry out community disease control.

2.06 Understand and describe the Morphology and the Systemic Functions of Protozoans, Mushrooms, Algae, Molds, Yeasts and Fungi pointing out their Parasitic and/or Free-living States.

Describe the Morphology of a group of Multicellular Plants mainly including Mosses, Ferns and Seed Plants.

3.01 The students should be able to describe the Mosses and Ferns pointing out their relatives in the Plant Kingdom.

3.02 Describe the structure and functions of the various specialized organs and tissues composing the plant body of a flowing plant.

3.03 Describe the reproductive cycle of Mosses Ferns.

3.04 Describe the structure and functions of a Leaf, Root, and Stem and pointing the adaptatives of these Vegetative Organs for specialized functions.

3.05 Identify the external factors that influences plant growth.

3.06 Demonstrate the Vegetative Production of plants by cuttings, budding and grafting.

3.07 Describe the reproductive process of plants.

3.08 Describe various types of fruits and seeds and the way in which they are dispersed.

3.09 Describe seed germination and the conditions required for germination.

Describe the general Morphology and to understand how the various systems function in the Sponges, Coelenterates. Flatworms, Roundworms, Mullusks, Echinoderms and Arthropods.

4.01 Understand Parasitism among the flat and roundworms to describe the life cycles and alternate hosts of many of these Organisms.

4.02 Identify the various health measures involved in the prevention of Parasitic Worm infestations.

4.03 Describe the general characteristic Mollusks and Arthropods.

4.04 Classify insects on the basis of body Structure and Metamorphosis.

4.05 Understand and identify the problems caused by insectpests, including carriers and host of diseases.

BEST COPY AVAILABLE

4.06 Understand insect control measures carried ou
the Ministry of Public Health.

5.00 Describe the general characteristics and to underst
the various systems function in the Fishes, Frogs/T
Salamanders, Snakes, Lizards, Crocodiles, Turtles,
and Mammals.

5.01 List the general characteristics of Vertebra
5.02 Classify Vertebrates.
5.03 Describe the structure of the organs and syst
Vertebrates and their functions.
5.04 Identify the Vertebrates in our Community poi
out their economic importance to design a com
tive analyse list of Man's relationship to the
other Vertebrates.

6.00 Describe the Skeletal, Muscular, Digestive, Circulat
Excretory, Respiratory, Nervous, Regulatory and Repro
tive Systems of Man.

6.01 Understand the history of Man and how Scienti
attempt to fit together small bits of informa
to visualize life in the past.
6.02 Describe the Tissues, Organs, and Systems com
the Human body.
6.03 Describe the Systems of the Human body and the
functions.

BEST COPY AVAILABLE

SENIOR HIGH SCHOOL BIOLOGY SYLLABUS

GRADE 10

PIC: **INSTRUCTIONAL ITEMS TO BE EMPHASIZED**

Nature of Life:

The major branches and some contributions to the field. The scientific method and its application. General characteristics of livingthings. The general classification of livingthings. The cell - chemical and structural make-up; cell growth and division; cell processes: The cell and its environment; Photosynthesis, respiration and cell energy; Nuclear acid and protein synthesis. Microscopy-study of the parts of a microscope.

. Microbiology:

1. Protozoans: morphology, methods of locomotion, life cycle of ameeba, euglena, paramecium, plasmodium and of vectors such as mosquitoes and tsetse fly.
2. Viruses, bacteria and rickettsiae-morphology, chemical make-up, classification, methods of reproduction, respiration in bacteria and their relatives, harmful and beneficial effects on plants, animals and human; control and conditions for growth; effects of antibiotics and antiseptics on bacterial growth.
3. The spread and control of infectious organisms - methods of transfer, incubation period, ways in which they cause disease, the body's line of defense (structural, cellula, and anti-bodies), immunization and various kind of therapy.
4. Fungi and Algae-general characteristics and classification of each group-methods of reproduction (alternation of generations) - economic importance; symbiotic relationship between algae and fungi (lichens); specific study of bread molds, yeasts - poisonous and edible mushrooms, protococcus and sprogyra. Diseases caused by fungi and poisonous effect of algae.

BEST COPY AVAILABLE

7. Multicellular Plants:

1. (Higher Crytograms) Bryophytes - non-vascular plants: (Mosses and liverworts); - structure, life cycle; (alternation of generations) economic importance.
2. Tracheophytes - Vascular plants:
   a. Pteridophytes (ferns and their relatives) - structure, life cycle (alternation of generations) economic importance; some common of Liberia, distinguishing features between Bryophytes and Pleridophytes.

   b. Spermatophytes (seed plants) Gymnosperms - General characteristics (evergreen, cone bearing-nicked seeds) eg. African pine and cycad.

   c. Angiosperms (flowering plants) - General characteristics, types, external and internal structures of roots, stems and leaves; environmental factors effecting plant growth (tropisms and hormones) - Reproduction-types, structures and functions of flower parts (pistil-stamen and corolla); pollination (self and cross); fertilization - formation of fruits and seeds; types of fruits (simple, aggregate multiple); fruit and seed disperal (wind, water, animal, explosive mechanism and man); The parts and kind of seeds (monocot and dicot).

   Germination and conditions for germination. Water relations in plants - water absorption, mineral absertion, water loss, translocation of water, food and minerals; water pressure wilting and loss of turgor-guttation. Transpiration and photosynthesis.

Invertebrates:

General characteristics and classification

1. Review protozoons as mentioned under microbiology
2. Sponges, hydras and their relatives morphology and reproduction. Importance of regeneration; methods of food getting and economic importance.

3. Platyhelminthese(flat worms) - types, geographical distribution, morphology, life cycle, control, and economic importance of the lives fluke, planaria, blood flukes such as schitosoma heremotobium, schistosoma mansona, and tape worms.

4. Nematodes (round worms) types, geographical distribution, life cycle, control and economic importanc of ascaris, hookworm, trichinella, falaria, trichuris.

5..Annelids (segmented worms) geographical distribution, morphology and life cycle; detail study of the digestive, circulatory, and reproductive systems eart worms.

6. Mollusks (soft-bodied invertebrates) - characteristi anatomy of clam and snail; life cycle of mollus ; destructive nature of snails and slugs; locomotion and economic importance.

7. Echinoderms (spiny-skinned invertebrates) - characte tics, structure, feeding habits, locomotion, reprodu tion and regeneration; economic importance.

8. Arthropods (jointed appendages) - classes - crustac chilopoda, diplopoda, arachnida, insecta; advantage and disadvantages of the exoskeleton. Growth, reproduction, mutrition, respiration, irritability. Economic importance of arthropods.

Morphology of Crayfish

a. Insecta (familiar arthropodes) - general charact and tructure (external and internal reproducti (complete and incomplete metamorphasis); orders insects; social structure and behavior of bees, termites, or ants; anatomy of grasshopper or coc roach; the importance of insects to man; harmfu (mosquito, tse-tse fly, house fly.

BEST COPY AVAILABLE

. Vertebrates:

1. General characteristics - classes of vertebrates (cyclostomata, pisces, amphibia, retilia, Aves and mammalia). Specialized systems of vertebrates and types of behavior.
2. Pisces (fishes) - characteristics of cartilaginous fishes including the shark; Difference between sharks and bony fish. Respiration locomotion migration and economic importance of a fish.
3. Amphibia - General characteristics (external and internal feature); orders - life circle, locomotion, feeding habits respiration; adaptations; Regeneration; importance to man (typical example frog or toad)
4. Reptila - Historical background of reptiles, characteristics, kinds, adaptations, feeding habits locomotion, methods of reproduction and regeneration. Study morphology of the agama lizard, snakes - structure of the jaw and poison apparatus - Identification of poisonous and non-poisonous snakes; first aid for snake bites.
5. Aves (birds) characteristics - structure and feature alimentary system of birds, adaptations for flight; flightless birds, reproduction - development of the chick embryo; sex differentiation in birds. Incubation, classification of birds migration according to beak and feet (example chicken) and economic importance.
6. Mammals - characteristics, classes, adaptations, nutrition, respiration circulation, excretion, nervous systems; Reproduction and parental care; geographical districution and economic importance.

griculture:

Soil - soil formation; types of soils - characteristics and constituents of soils - soil particles, soil water soil air; organic matter (humus); inorganic matter - soil acidity; soil organisms; fertilizing and rotation of crops, soil erosion and conservation.

BEST COPY AVAILABLE

SCOPE AND SEQUENCE ANALYSIS
OF INSTRUCTIONAL TOPICS

BIOLOGY GRADE 10

First Semester

First Period

Unit I

I. Nature of Life:

1. The field of biology
2. Some contributors to the field
3. The scientific method and its application to biology
4. General characteristics of living things
5. Classification of living things
6. Cell-types, structural and chemical make-up
7. Cell microscopy
8. The cell and its environment
9. Cell processes
10. Photosynthesis, respiration and cell energy
11. Nucleic acid and protein synthesis
12. Cell growth and division

Second Period

Unit II

II. Microbiology

1. The viruses
    a. Morphology
    b. Chemical make-up
    c. Classification
    d. Reproduction
    e. Some virus diseases
    f. Spread and control of virus diseases
2. Bacteria and related organisms
    a. Morphology
    b. Distribution
    c. Motility
    d. Conditions for growth

BEST COPY AVAILABLE

INSTRUCTION THROUGH THE USE OF INDIGENOUS MATERIALS

Does this inhibiting environment happen because the teacher thinks of learning only in terms of facts and skills, by rote and memorization, by oral recitation and in other kinds of teacher led activities? Is the acquisition of facts and figures the only objective of education? This kind of learning provides a very small segment of the kind of learning students can best absorb. The teaching-learning act, to be both efficient and effective, demands that students demonstrate comprehension, application, analysis, synthesis and evaluation of the information presented by the teacher. This process requires the active participation, interest, emotionalism, conscious commitment, on the part of the learner as well as on the part of the teacher. Education is not a passive process that focuses solely on the offerings of a dreary textbook and notes in a notebook. The text and the notebook are aids to learning and provide a minimal environment in which to teach and to learn.

The purpose of this booklet is to expand the potentials for learning which, when properly used, will lead to affective learning.

Affective learning concerns the emotions and focuses on the reality of what the learner brings to the classroom---interest, humor, a questioning attitude, inquisitiveness, the love of mystery, the thrill of discovery, enquiry, and kind of commitment which, if used to advantage, makes teaching the most rewarding occupation available. These are the things which education is all about and they contribute to the vital acquisition of attitudes, behaviors, appreciations, interests, understandings, skills, morals, tastes, and standards which, in addition, characterize the educated man.

STUDENTS PARTICIPATION IN THE PREPARATION

All sorts of instructional aids contributes to effective learning. The interest that the preparation of these aids provide encourages students to develop favorable attitudes toward school. It

INTRODUCTION --

Teachers say time and time again that they do not have materials to work with in the classroom. "How can we teach?" they ask. Many teachers fail to realize that a room full of new books does not guarantee good teaching nor learning. Teachers often do not see the world of indigenous resources around them which provides them with free teaching materials. Good teaching can take place without new books, manufactured materials, and expensive classroom equipment. Every teacher must learn to improvise. He must look at all times for materials which may be waste at the market place, the corner store, the farm, or the home. He can also have his students in the classroom help search for and prepare materials that can be used in the teaching-learning process.

Most teachers in Liberia's rural schools will find that they must develop their own teaching materials and instructional aids because textbooks are scarce. Indigenous materials --- those items native to Liberia suck as raffia, rattan, bamboo, shells, twigs, banana leaves, cassava flour etc are abundant and free. A teacher can plan learning activities for his/her students around the indentification, collection and preparation of the materials that are to be used as instructional aids.

By using indigenous materials, the teacher provides free teaching materials and instructional aids for his/her students. These materials help students learn important concepts, develop an appreciation for Liberia's natural resources, and understand the function and necessity of retaining traditional arts and crafts.

It is small wonder that children are anxious to get outdoors to enjoy the beauty of their world, especially when classroom walls are bare, when their work is not proudly displayed, when seating arrangements are rigid and formal, and the total environment is colorless.

INSTRUCTION

Through the Use of Indigenous Materials

Revised and Adapted
from
Instructional aids and ideas through of Indigenous
Materials, Curriculum and Materials Center, Department
of Education, Republic of Liberia and U.S.A.I.D.,
August 1967

Kakata Rural Teacher Training Institute
Kakata, Gibi Territory, Republic of Liberia
and
Peace Corps Liberia
August, 1979

also arouses and sustains interest in learning, motivates students to adopt self-directed activities, and helps to provide the kinds of experiences which lead to a transfer of skills and understandings. Research about teaching and learning shows that instructional aids when properly used enable students to learn more and to remember more for a longer period of time than similar students taught with conventional texts because these students participate in the teaching - learning process - they learn by doing.

Since each student learns best by a variety of teaching methods, teachers must learn to appreciate and use many approaches which are available through use of indigenous materials in the classroom. It is hoped that the ideas presented in this manual will help you to reach more of your students more effectively than ever before. Try to prepare some of these materials and discover what joy teaching can be. Experiment with these suggestions and try to find other materials available for use in making instructional aids. By all means, let the students share in making some of these instructional aids. Good luck in making your classroom a cheerful, colorful, exciting place for learning!

Contributors:

Dorothy Cooper formerly Instructional Materials Coordinator

Edna Wordsworth formerly Elementary Education

Rita M. Roy, Language Arts & Social Studies Consultant, USAID

John S. Williams, Head of Arts & Crafts Department, K.R.T.T.I.

Marilyn Lashley, Teacher Trainer, Volunteer Peace Corps Liberia.

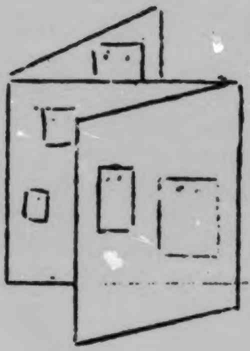
22. Measuring tools
    cup
    pint gallon
    quart
    12" ruler   Both are made from a strip of wood or
    yard stick   reed but the inch marking must be accurate.
23. Marking pen or black crayola
24. Scissors
25. Cassava paste in jars
26. Old newspapers, magazines or catalogues
27. Collection of stones, shells, sticks and seeds.
28. Scarp cardboard, paper or cartons for name cards, language arts activities, etc.
29. Games (made by the teacher)
30. Permanent Seatwork (made by the teacher)

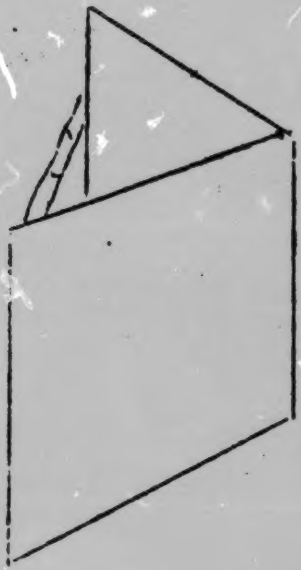
THE TEACHING KIT

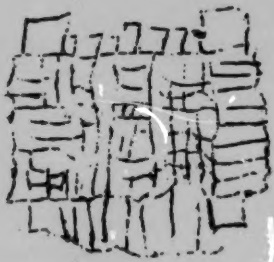
A TEACHING KIT is a collection of tools that is necessary for good teaching everyday. This KIT is prepared by the teacher before the opening of the school year. Each tool in the KIT is used over and over again by the children and the teacher. A good teacher cannot teach school without his TEACHING KIT ready at all times.

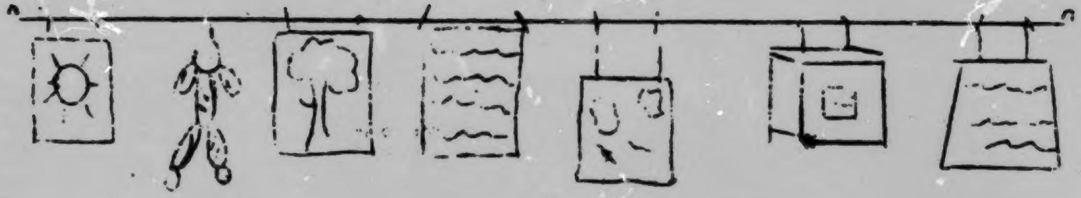
1. Pocket chart
2. Alphabet strip
3. Word pattern cards
4. Collection of pictures
5. Color chart
6. Patterns for drawing (used by the teacher, not the children)
7. Flannel board
8. Phonics cards
9. Numberline (see syllabus)
10. Clock face
11. Calendar
12. Number picture cards or chart 1-10 (grades 1 - 2)
13. Number chart 0-10
14. Number combination cards (see syllabus for combinations)
15. Place value chart (see syllabus)
16. Map of Liberia
17. String, raffia, yarn
18. Pins, pegs, thorns or reeds
19. Paper bags
20. A personal collection of stories, original stories, poems riddles, jingles
21. Geometric shapes
    - Circle
    - Square
    - Rectangle (Large. Cut from cartons.)
    - Triangle

Every teacher should feel it his responsibility to erect as many bulletin boards as is possible. Every bit of space that is not occupied with blackboards can be used for bulletin boards. Pictures should never be pasted directly on the walls of the classroom. See illustrations and suggestions that follow:









Stretch a piece of wire, rope or raffia across the room. Hang pictures and crafts with raffia, clothespins or clips.

BULLETIN BOARDS

With the wealth of indigenous materials here in Liberia, there is no excuse for a teacher not constructing bulletin boards for the individual classroom. Materials that can be used as bulletin boards are:

1. A piece of bamboo or reed matting--the size would depend on wall space.
2. Firm side of a cardboard or light wood crate.
3. Square cardboard pieces from cartons.
4. Labanese paper.
5. Flannel board.

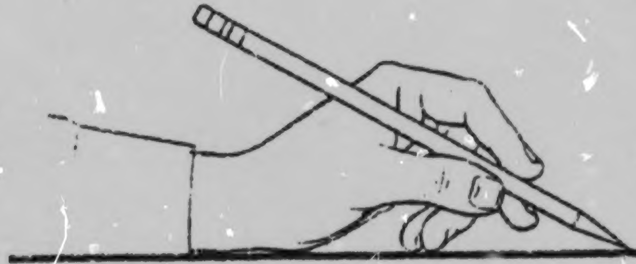
Directions:

1. Cut the mat, carton or board to the desired size.
2. Paint it if paint is available.
3. If edges of carton or mat are rough, paste paper over the edge using cassava paste, magazine pages or newspapers cut in strips.
4. Tack the bulletin boards to the walls with nails, thorns, reeds or pegs.
5. Always mount your bulletin boards so that the children can reach them and that all mounted materials will be at their eye level.

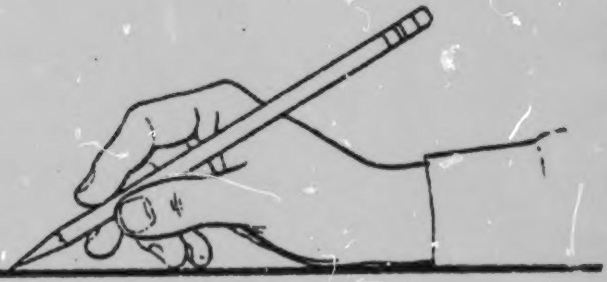
If one of the above mentioned materials is not available, the following suggestions can be used successfully:

1. Open old rice bags at the sides. Wash and hang. Attach pictures to the open bags with reeds, thorns or pins.
2. Hang a piece of Fanti cloth or an old blanket.
3. Stretch a piece of wire, string or raffia across the room.
4. Place a bamboo pole across the corner of the room. This also makes an excellent chart holder.

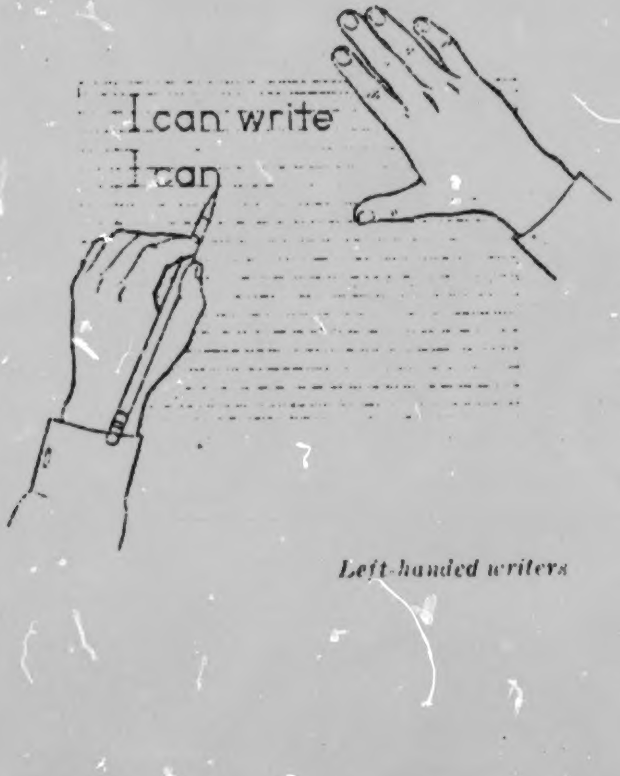
Bulletin boards are useful aids in display work, for pictures and student exhibits, etc. Be proud to serve the interests of your students by providing them with a bulletin board to display their own accomplishments and objects in which they are interested. Bulletin boards are as necessary to everyday teaching as the books that are read and discussed. Experts say that what children learn depends on our ability to control the various events that occur in the classroom. Is your classroom conditioned for this learning? What appears on the display areas of the classroom and the arrangement of these materials determine, to a high degree, what motivates children, what is learned, what standards of performance are established, and how interest is created and sustained. Alive, stimulating and well planned bulletin boards make a classroom a place where learning takes place.



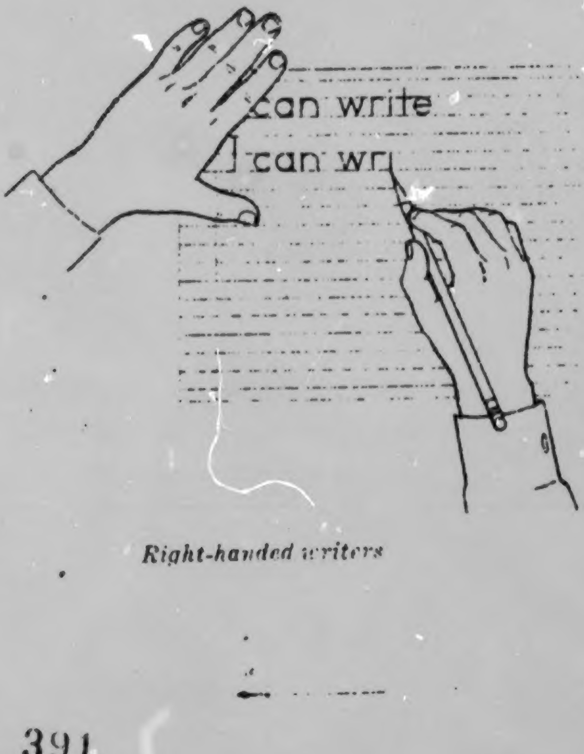
Left-handed writers



Right-handed writers


I can write
I can

Left-handed writers


can write
I can wr

Right-handed writers

READING

This bulletin board can feature words, sounds, adventure, places, conversations, books, pictures, puzzles, poems, riddles, jokes, and a great variety of experiences.

Your reading displays can:

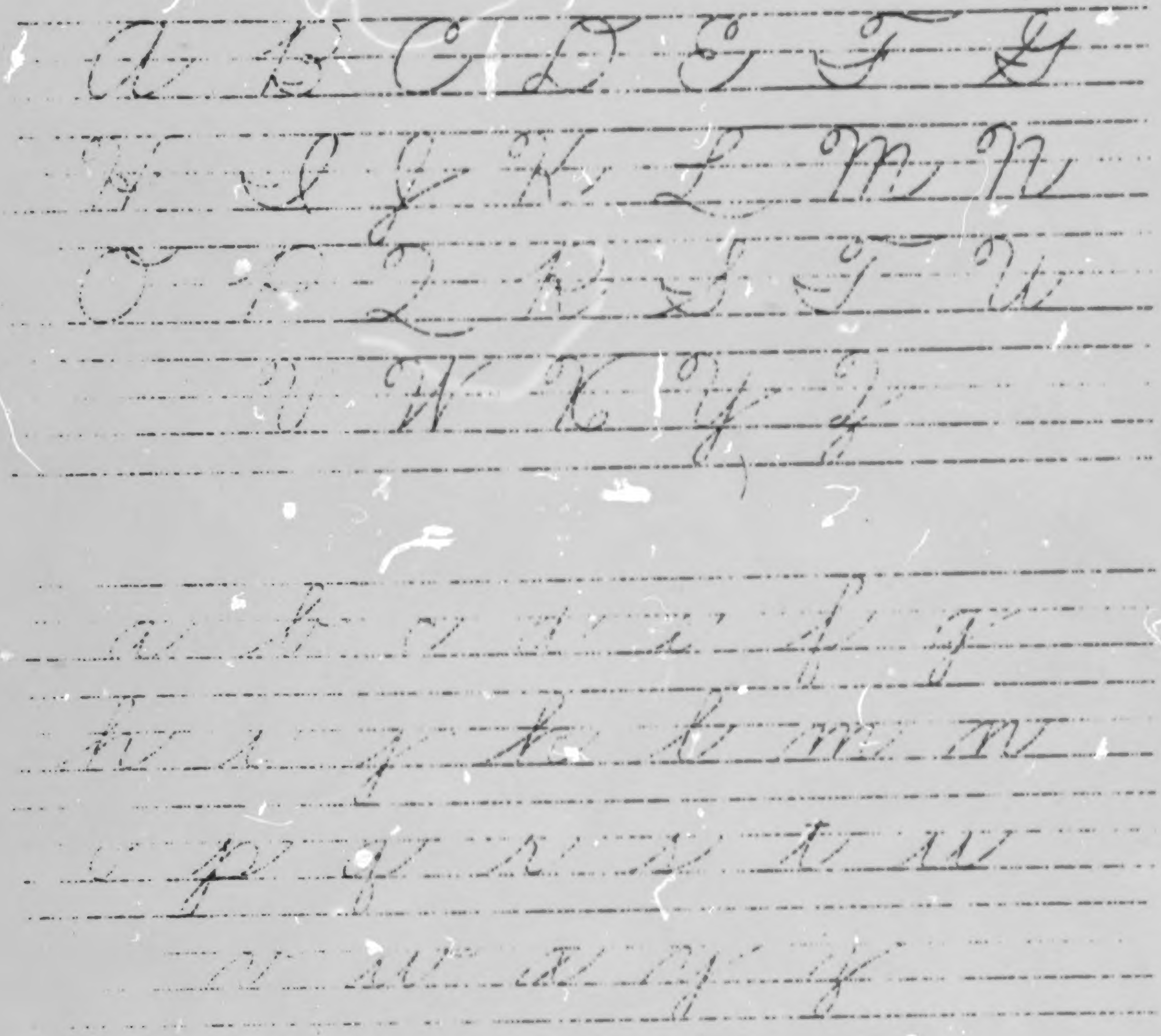
- emphasize good reading habits
- keep a record of all the achievements of the class or group
- stimulate interest in a variety of books through reports, stories, pictures or sketches made by the children
- ask questions, introduce words, and interpret stories
- relate stories to music, art, science, history, and places of interest
- puzzles that match authors or characters to stories and books
- pictures and captions that go together or describe an event
- words organized into family groups by use of word patterns
- problems that ask the pupil to supply the missing words of phases
- questions that can be answered only by further reading
- settings against which children can dramatize their favorite stories
- help to understand more efficient ways to use the dictionary
- and make better use of the library and resources materials.

MANUSCRIPT PRINTING

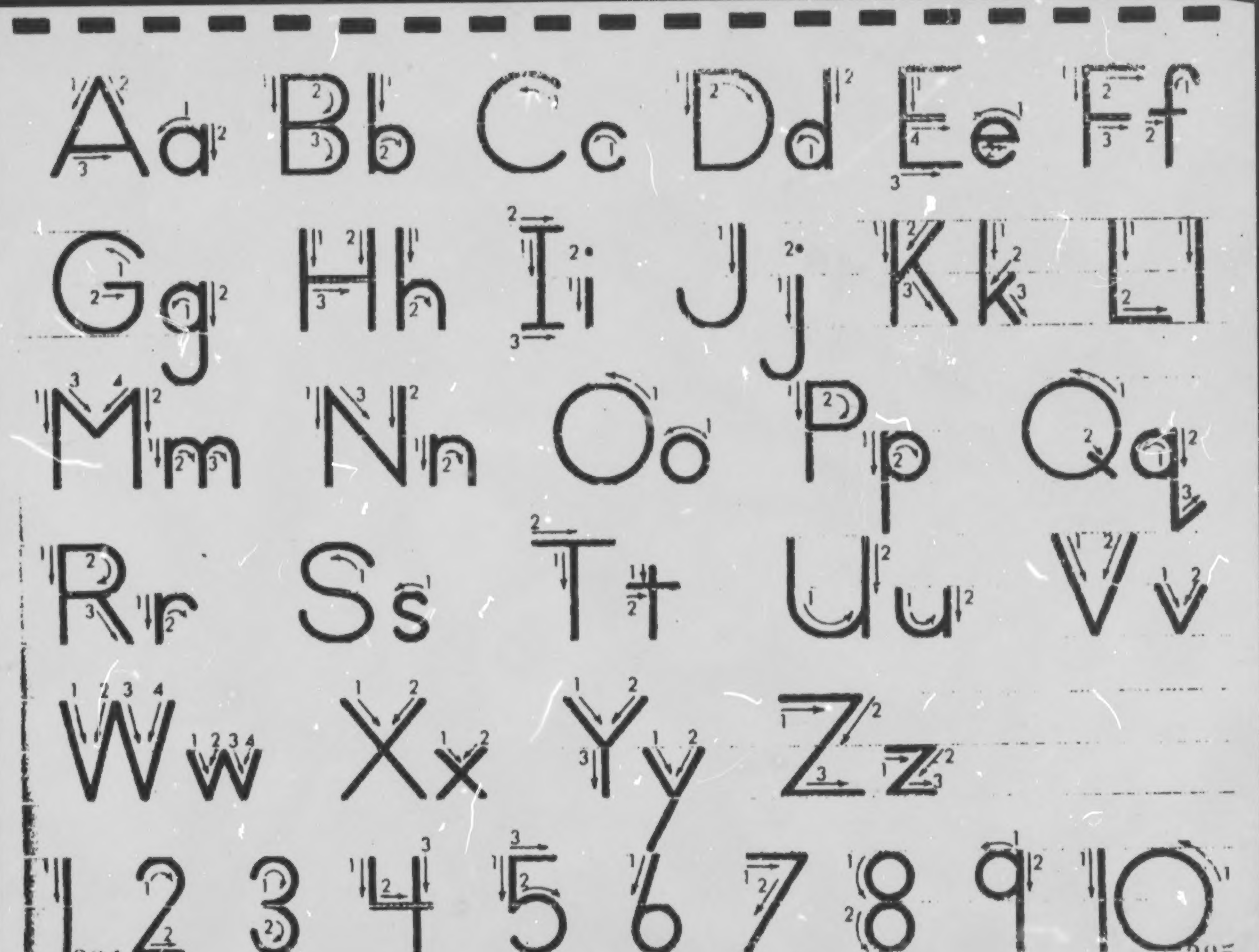
Teachers in the primary grades should spend considerable time on teaching your students correct manuscript printing and cursive writing.

Include in this booklet is a smaple of both styles. Teach your students correct placement of each letter on ruled paper. Let them practice, practice, practice.

Handwriting Models


A B C D E F G
H I J K L M N
O P Q R S T U
V W X Y Z
a b c d e f g
h i j k l m n
o p q r s t u
v w x y z

BEST COPY AVAILABLE


Aa Bb Cc Dd Ee Ff
Gg Hh Ii Jj Kk Ll
Mm Nn Oo Pp Qq
Rr Ss Tt Uu Vv
Ww Xx Yy Zz
1 2 3 4 5 6 7 8 9 10

WRITING AND SPELLING

Your bulletin board can creat a desire to write. It can provide materials that encourage ideas or topics to develop. Please give recognition to children's creative work.

Set up a writer's corner. It will need a collection of imaginative pictures or objects. Place a dictionary, pencil and writing tools in the corner. Permit children to go to this corner when their work is completed so that they can write creatively about the pictures or objects. Set up rules for your writing corner.

- * spelling rules
- * dictionary skills
- * how to study spelling
- * work structure and analysis
- * meaning of words
- * announce team awards
- * display word puzzles
- * display spelling games ehere children can match words with their meanings.

HEALTH

Use your health display to:

- * stress exercise, rest, diet
- * explain disease and means to prevent it
- * show proper care of teeth, hair and skin
- * demonstrate methods of first aid
- * methods of building a latrine
- * how to purify water
- * methods of collecting the rain
- * interest children in careers of dresser, nurse, doctor, vitinarian

You can use your health display:

- * pictures, slogans, and photo from magazines
- * thermometers, bandages, crutches, combs, toothbrushes
- * graphs, safety signs, posters, songs and poems
- * rubber boots, sandles, raincoats, umbrellas
- * soap, sponge, pans
- * food packages, CARE food labels, (cereal and milk labels)

SOCIAL STUDIES

Bulletin boards prepared on social studies may feature people, places sorts, products processes, politices, patriots, communication, etc. These displays should have a definite purpose related to the work of the class. Everything should be correctly indentified by labels, captions, illustrations or text.

The following will add interest:

- * present facts and unite basic understandings from the many pieces of information
- * arouse curiosity and encourage further investigation
- * show comparisons between then and now, here and there, time and distance.
- * analyze products, inventions, people, forms of government.
- * provide opportunities for pupils to creat and plan together.

Obtain some cotton yarn, string or raffia. Soak it in an extra thick mixture of warm cassava starch. Spread it out on wax paper or a large stone to dry. Try this for letters on the bulletin board, figures and borders.

Cut letters from the mesh (net like texture) from the inside of the bark from the coconut tree. Soak the mesh in a thick mixture of warm cassava starch. Dry before cutting letters and figures.

FLANNEL BOARD

To make a flannel board, secure a piece of board or two sides of a carton or crate. Tack flannel material or a blanket across one side. The other side can be painted as a chalkboard. Lace the two places of carton sides with raffia. In making a flannel board in this manner, it can easily be folded and stored to keep it clean. If flannel or a blanket is not available, cover the surface with thick cassava paste. While it is still wet and sticky pour sand on top. Let the sand and cassava mixture dry in the sun.

Cit pictures from magazines, shapes, numerals, children's sketches, etc. Paste these on cardboard. Cut again. Place a small piece of sand-paper _or cassava and sand) behind each figure. This will make it hold to the flannel board as it is displayed. If the board is made from cassava and sand, use small strips of flannel or blanket on the figures to be displayed.

SCREENS

Screens are also very useful for displaying materials. They add an air of living, a breath of fresh intellectual air to the classroom. Again, local and/or waste materials can be used to advantage at no cost whatever.

1. A strip of matting of the type available anywhere in Liberia will serve.
2. Thin planks to form a border are easily available. Old floor boards will do the job
3. Two sides of a cardboard or wooden carton will serve adequately. If four sides of a carton are used, cut them so as to join them together at the edges with punched holes through which string or raffia can be passed as in stitching. The screen may be painted or left plain.

Stand it upright on the floor or your desk and you are ready to display books, pictures, student work, charts, drawings, etc. A screen serves llent room divider. It will help to cut down the noise in a

ARITHMETIC

The arithmetic bulletin board can help children to understand:

* comparisons of size and amount
* parts of things and wholes
* coins and money values
* number families
* methods of measurement
* the vocabulary of arithmetic
* how to read graphs
* the meaning of fractions
* number charts
* number picture cards
* objects for counting
* number games

……

Tone up your bulletin boards with a variety of materials that will add contrast. LOOK ABOUT! The world is full of rough, shiny, soft, spongy, geometric, matted, irregular, dull, irodescent, and colorful materials. Think twice before you pass up or discard unusual substances that have eye appeal.

Be sure you display students work.

SO START GATHERING

Rope - yarn - raffia - split bamboo - reed - seed pods - rice bags - Fanti scraps - egg cartons - wire - screening - nuts - steel wool - boxes - wax paper - sand paper - sand - gravel - moss - pipe cleaner - cellophane - plastic - styrofoam - aluminum foil - leather - unusual wood and bark - sawdust - cardboard - ribbons - buttons - shells - tile - seeds -

LET THE TEXTTURE OF THE ABOVE MATERIALS TICKLE YOUR IMAGINATION AS YOU WORK ON PROJECTS AND PLAN YOUR BULLETIN BOARDS!

ALPHABET TEMPLATES

It is a good idea to have letters cut from cardboard or heavy paper that will be available at any time for tracing or pinning to the bulletin board.

Twisted aluminum foil can be used to form letters. Fasten them to your exhibit with pins, thorns or reed.

See figure 1 on page 4.

NOTE ABOUT PASTE

Cassava paste to serve as an all purpose paste is quite simple to make. Peel, wash and grate four medium cassavas. Add cold water and strain through a piece of cloth. Pour grated material on a cloth and strain. Using the mixture remaining after straining, wrap in a cloth so as to make a roll that can be squeezed. The idea here is to wash out the starch and save it to use as a paste. The residual cassava chaff should be discarded. Let the starch stand in a container for one hour. Pour off liquid and scrape starch from the bottom of the container and set in the sun to dry. To make paste, place two cups of water into a kettle and boil. A handful of starch mixed with cold water to the consistency of fritter batter should be stirred constantly as boiling water is added. Thick or thin paste can be made depending upon the amount of hot water added. Paste can be stored in covered jars for everyday use in the classroom.

CHART HOLDER

Pieces of wrapping paper or used newspapers make excellent chart holders. Paste together four sheets of regular size newspaper with cassava paste. From the top, measure down three inches and two inches alternately. Draw lines across the paper so that pockets will be of uniform size. Fold up into pockets and fasten edges by pasting strips of paper along the edges, and fold edges on each side to the back. Lay flat to dry. The size of the chart holders will depend upon the size of materials to be inserted. For instance sentence strips will need wider pockets than will value charts, alphabet cards, pictures, spelling words, names for room helpers, etc.

Chapter 5

Using the Taxonomy of Educational Objectives

One of the most helpful guides in identifying and defining instructional objectives is the *Taxonomy of Educational Objectives*, developed by committees under the direction of Bloom (1956) and Krathwohl (1964). The taxonomy provides a classification of educational objectives that is analogous to the classification scheme used for plants and animals. It consists of a set of general and specific categories that encompass all possible learning outcomes that might be expected from instruction. The classification system was developed by psychologists, teachers, and test experts for use in curriculum development, teaching, and testing. Because the system is based on the assumption that learning outcomes can be best described in terms of changes in student behavior, it is especially useful to teachers who are attempting to state their instructional objectives in behavioral terms.

The taxonomy is divided into three parts: (1) the cognitive domain, (2) the affective domain, and (3) the psychomotor domain. The cognitive domain includes those objectives that emphasize intellectual outcomes, such as knowledge, understanding, and thinking skills. The affective domain includes those objectives that emphasize feeling and emotion, such as interests, attitudes, appreciation, and methods of adjustment. The psychomotor domain includes those objectives that emphasize motor skills, such as handwriting, typing, swimming, and operating machinery. A complete classification system was developed for the cognitive and affective domains by the Bloom and Krathwohl committees, but the preparation of the psychomotor domain was never completed. In recent years, however, at least two major classification systems for the psychomotor domain have been prepared, neither one by the original taxonomy developers. We shall present one of these psychomotor systems for illustrative purposes.

The Cognitive and Affective Domains

The cognitive and affective domains have the most highly developed and detailed classification systems. The categories and subcategories in each of these domains are arranged in hierarchical order, from the simplest behavioral outcomes to the most complex. The cognitive domain, for example, starts with simple knowledge outcomes and then proceeds through the increasingly complex levels of comprehension, application, analysis, synthesis, and evaluation. Each category is assumed to include the behavior at the lower levels. Thus comprehension includes the behavior at the knowledge level; application includes that at both the knowledge and comprehension levels, and so on. The affective domain follows a similar hierarchical pattern, ranging from the simple receiving of stimuli to the development of a value system that characterizes an individual's life style.

On the following pages, in Tables II and IV, are brief descriptions of each of the major categories in the cognitive and affective domains. Accompanying Tables (III and V) also present examples of objectives and illustrative behavioral terms (for stating the specific learning outcomes) for each of the categories. These examples should help clarify the meaning of each category and suggest types of learning outcomes to consider when identifying and defining instructional objectives. The illustrative objectives are not exhaustive, of course, but a review of them should stimulate you to think of a broader range of objectives for your particular area of instruction.

The list of behavioral terms for each taxonomy category is only a sample of some of the more relevant action verbs. It must also be kept in mind that frequently the same behavioral term may be appropriately used at several levels. The term *identifies*, for example, is appropriate in each of the following cases:

Knowledge:	Identifies the correct definition of the term.
Understanding:	Identifies examples of the principle.
Application:	Identifies proper grammer usage.
Analysis:	Identifies the parts of a sentence.

Despite this considerable overlap in the use of behavioral terms, there are some action verbs that are more directly relevant to one taxonomy category than to another. Those listed in the tables are merely suggestive; but they can assist in selecting the behavioral terms that most clearly convey the instructional intent of a given objective. More comprehensive lists of action verbs for stating specific learning are presented in Appendix B.

If you would like more elaborate and detailed treatments of the cognitive and affective domains, see the handbooks by Bloom (1956) and Krathwohl (1964) in the list of references in Appendix C. Both books provide extensive descriptions of the major and minor categories, with numerous illustrative objectives and test items.

The Psychomotor Domain

The psychomotor domain is concerned with motor skills. Although this domain includes some learning outcomes that are common to most subjects

TABLE II. Major Categories in the Cognitive Domain of the Taxonomy of Educational Objectives (Bloom. 1956)

Descriptions of the Major Categories in the Cognitive Domain
1. **Knowledge.** Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain.
2. **Comprehension.** Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.
3. **Application.** Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area require a higher level of understanding than those under comprehension.
4. **Analysis.** Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.
5. **Synthesis.** Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan of operations (research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of *new* patterns or structures.
6. **Evaluation.** Evaluation is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria. These may be internal criteria (organization) or external criteria (relevance to the purpose) and the student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgments based on clearly defined criteria.

TABLE III. Examples of General Instructional Objectives and Behavioral Terms for the Cognitive Domain of the Taxonomy

Illustrative General Instructional Objectives	*Illustrative Behavioral Terms for Stating Specific Learning Outcomes*
Knows common terms Knows specific facts Knows methods and procedures Knows basic concepts Knows principles	Defines, describes, identifies, labels, lists, matches, names, outlines, reproduces, selects, states
Understands facts and principles Interprets verbal material Interprets charts and graphs Translates verbal material to mathematical formulas Estimates future consequences implied in data Justifies methods and procedures	Converts, defends, distinguishes, estimates, explains, extends, generalizes, gives examples, infers, paraphrases, predicts, rewrites, summarizes
Applies concepts and principles to new situations Applies laws and theories to practical situations Solves mathematical problems Constructs charts and graphs Demonstrates correct usage of a method or procedure	Changes, computes, demonstrates, discovers, manipulates, modifies, operates, predicts, prepares, produces, relates, shows, solves, uses
Recognizes unstated assumptions Recognizes logical fallacies in reasoning Distinguishes between facts and inferences Evaluates the relevancy of data Analyzes the organizational structure of a work (art, music, writing)	Breaks down, diagrams, differentiates, discriminates, distinguishes, identifies, illustrates, infers, outlines, points out, relates, selects, separates, subdivides.
Writes a well organized theme Gives a well organized speech Writes a creative short story (or poem, or music) Proposes a plan for an experiment Integrates learning from different areas into a plan for solving a problem Formulates a new scheme for classifying objects (or events, or ideas)	Categorizes, combines, compiles, composes, creates, devises, designs, explains, generates, modifies, organizes, plans, rearranges, reconstructs, relates, reorganizes, revises, rewrites, summarizes, tells, writes
Judges the logical consistency of written material Judges the adequacy with which conclusions are supported by data Judges the value of a work (art, music, writing) by use of internal criteria Judges the value of a work (art, music, writing) by use of external standards of excellence	Appriases, compares, concludes, contrasts, criticizes, describes, discriminates, explains, justifies, interprets, relates, summarizes, supports

TABLE IV. Major Categories in the Affective Domain of the Taxonomy of Educational Objectives (Krathwohl, 1964)

Descriptions of the Major Categories in the Affective Domain

1. **Receiving.** Receiving refers to the student's willingness to attend to particular phenomena or stimuli (classroom activities, textbook, music, etc.). From a teaching standpoint, it is concerned with getting, holding, and directing the student's attention. Learning outcomes in this area range from the simple awareness that a thing exists to selective attention on the part of the learner. Receiving represents the lowest level of learning outcomes in the affective domain.

2. **Responding.** Responding refers to active participation on the part of the student. At this level he not only attends to a particular phenomenon but also reacts to it in some way. Learning outcomes in this area may emphasize acquiescence in responding (reads assigned material), willingness to respond (voluntarily reads beyond assignment), or satisfaction in responding (reads for pleasure or enjoyment). The higher levels of this category include those instructional objectives that are commonly classified under "interests"; that is, those that stress the seeking out and enjoyment of particular activities.

3. **Valuing.** Valuing is concerned with the worth or value a student attaches to a particular object, phenomenon, or behavior. This ranges in degree from the more simple acceptance of a value (desires to improve group skills) to the more complex level of commitment (assumes responsibility for the effective functioning of the group). Valuing is based on the internalization of a set of specified values, but clues to these values are expressed in the student's overt behavior. Learning outcomes in this area are concerned with behavior that is consistent and stable enough to make the value clearly identifiable. Instructional objectives that are commonly classified under "attitudes" and "appreciation" would fall into this category.

4. **Organization.** Organization is concerned with bringing together different values, resolving conflicts between them, and beginning the building of an internally consistent value system. Thus the emphasis is on comparing, relating, and synthesizing values. Learning outcomes may be concerned with the conceptualization of a value (recognizes the responsibility of each individual for improving human relations) or with the organization of a value system (develops a vocational plan that satisfies his need for both economic security and social service). Instructional objectives relating to the development of a philosophy of life would fall into this category.

5. **Characterization by a Value or Value Complex.** At this level of the affective domain, the individual has a value system that has controlled his behavior for a sufficiently long time for him to have developed a characteristic "life style." Thus the behavior is pervasive, consistent, and predictable. Learning outcomes at this level cover a broad range of activities, but the major emphasis is on the fact that the behavior is typical or characteristic of the student. Instructional objectives that are concerned with the student's general patterns of adjustment (personal, social, emotional) would be appropriate here.

TABLE V. Examples of General Instructional Objectives and Behavioral Terms for the Affective Domain of the Taxonomy

Illustrative General Instructional Objectives	*Illustrative Behavioral Terms for Stating Specific Learning Outcomes*
Listens attentively Shows awareness of the importance of learning Shows sensitivity to human needs and social problems Accepts differences of race and culture Attends closely to the classroom activities	Asks, chooses, describes, follows, gives, holds, identifies, locates, names, points to, selects, sits erect, replies, uses
Completes assigned homework Obeys school rules Participates in class discussion Completes laboratory work Volunteers for special tasks Shows interest in subject Enjoys helping others	Answers, assists, complies, conforms, discusses, greets, helps, labels, performs, practices, presents, reads, recites, reports, selects, tells, writes
Demonstrates belief in the democratic process Appreciates good literature (art or music) Appreciates the role of science (or other subjects) in everyday life Shows concern for the welfare of others Demonstrates problem-solving attitude Demonstrates commitment to social improvement	Completes, describes, differentiates, explains, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, selects, shares, studies, works
Recognizes the need for balance between freedom and responsibility in a democracy Recognizes the role of systematic planning in solving problems Accepts responsibility for his own behavior Understands and accepts his own strengths and limitations Formulates a life plan in harmony with his abilities, interests, and beliefs	Adheres, alters, arranges, combines, compares, completes, defends, explains, generalizes, identifies, integrates, modifies, orders, organizes, prepares, relates, synthesizes
Displays safety consciousness Demonstrates self-reliance in working independently Practices cooperation in group activities Uses objective approach in problem solving Demonstrates industry, punctuality and self-discipline Maintains good health habits	Acts, discriminates, displays, influences, listens, modifies, performs, practices, proposes, qualifies, questions, revises, serves, solves, uses, verifies

TABLE VI. A Classification of Educational Objectives in the
Psychomotor Domain (Simpson, 1972)

Description of the Major Categories in the Psychomotor Domain

1. **Perception.** The first level is concerned with the use of the sense organs to obtain cues that guide motor activity. This category ranges from sensory stimulation (awareness of a stimulus), through cue selection (selecting task-relevant cues), to translation (relating cue perception to action in a performance).

2. **Set.** Set refers to readiness to take a particular type of action. This category includes mental set (mental readiness to act), physical set (physical readiness to act), and emotional set (williness to act). Perception of cues serves as an important prerequisite for this level.

3. **Guided Response.** Guided response is concerned with the early stages in learning a complex skill. It includes imitation (repeating an act demonstrated by the instructor) and trial and error (using a multiple-response approach to identify an appropriate response). Adequacy of performance is judged by an instructor or by a suitable set of criteria.

4. **Mechanism.** Mechanism is concerned with performance acts where the learned responses have become habitual and the movements can be performed with some confidence and proficiency. Learning outcomes at this level are concerned with performance skills of various types, but the movement patterns are less complex than at the next higher level.

5. **Complex Overt Response.** Complex Overt Response is concerned with the skillful performance of motor acts that involve complex movement patterns. Proficiency is indicated by a quick, smooth, accurate performance, requiring a minimum of energy. This catergory includes resolution of uncertainty (performs without hesitation) and automatic performance (movements are made with ease and good muscle control). Learning outcomes at this level include highly coordinated motor activities.

6. **Adaptation.** Adaptation is concerned with skills that are so well developed that the individual can modify movement patterns to fit special requirements or to meet a problem situation.

7. **Origination.** Origination refers to the creating of new movement patterns to fit a particular situation or specific problem. Learning outcomes at this level emphasize creativity based upon highly developed skills.

TABLE VII. Examples of General Instructional Objectives and Behavioral Terms for the Psychomotor Domain

Illustrative General Instructional Objectives	*Illustrative Behavioral Terms for Stating Specific Learning Outcomes*
Recognizes malfunction by sound of machine Relates taste of food to need for seasoning Relates music to a particular dance step	Chooses, describes, detects, differentiates, distinguishes, identifies, isolates, relates, selects, separates
Knows sequence of steps in vanishing wood Demonstrates proper bodily stance for batting a ball Shows desire to type efficiently	Begins, displays, explains, moves, proceeds, reacts, responds, shows, starts, volunteers
Performs a golf swing as demonstrated Applies first aid bandage as demonstrated Determines best sequence for preparing a meal	Assembles, builds, calibrates, constructs, dismantles, displays, dissects, fastens, fixes, grinds, heats, manipulates, measures, mends mixes, organizes, sketches, works
Writes smoothly and legibly Sets up laboratory equipment Operates a slide projector Demonstrates a simple dance step	(Same list as for Guided Response)
Operates a power saw skillfully Demonstrates correct form in swimming Demonstrates skill in driving an automobile Performs skillfully on the violin Repairs electronic equipment quickly and accurately	(Same list as for Guided Response)
Adjusts tennis play to counteract opponent's style Modifies swimming strokes to fit the roughness of the water	Adapts, alters, changes, rearranges, reorganizes, revises, varies
Creates a dance step Creates a musical composition Designs a new dress style	Arranges, combines, composes, constructs, creates, designs, originates

(writing, speaking, laboratory skills), it receives major emphasis in commercial subjects, health sciences, home economics, industrial education, physical education, art, and music. Performance skills play a prominent role in the instructional objectives in these areas.

The classification system for the psychomotor domain that is shown in Table VI is one developed by Simpson (1972). It was selected for use because the categories seem appropriate for classifying a wide variety of different type motor skills. The major caterories, ranging from perception (the lowest level) to origination (the highest level), have a hierarchical arrangement similar to that in the cognitive and affective domains. As with the other two domains, illustrative objectives and relevant behavioral terms are presented for each category (see Table VII), to further clarify the various behavioral levels and to suggest types of learning outcomes to consider.

A taxonomy in the psychomotor domain has also been developed by Harrow (1972). Her taxonomy seems to be especially well adapted to the area of physical education, but may prove useful in other areas as well.

Instructional objectives in the psychomotor domain typically include concomitant cognitive and affective elements, but the demonstration of a motor skill is the dominant characteristic of the student's response. This overlapping of behavior from the different domains is, of course, not limited to performance skills. Learning outcomes in the cognitive area have some affective elements, and outcomes in the affective area have some coginative components. The three domains of the taxonomy provide a useful classification system, but they simply respresent particular emphases in stating objectives and not mutually exclusive divisions.

In summary, the *Taxonomy of Educational Objectives* provides a three-domain scheme (cognitive, affective, and psychomotor) for classifying all possible instructional objectives. Each domain is subdivided into a series of categories that are arranged in hierarchical order—from simple to complex. A review of these categories and the illustrative objectives and behavioral terms accompanying them (Tables II to VII) should aid in (1) identifying objectives for a particular instructional unit, (2) stating objectives at the proper level of generality, (3) defining objectives in the most relevant behavioral terms, (4) checking on the comprehensiveness of a list of objectives, and (5) communicating with others concerning the nature and level of learning outcomes included in a list of objectives.

As useful as the taxonomy may be, don't become a slave to the system of classification. Some objectives will include elements of all three taxonomy domains. Such objectives should not be discarded simply because they are difficult to classify. If revision will increase their usefulness, as well as their identification with one of the domains, then revision may be the answer. But if revision of the objectives distorts rather than clarifies their instructional intent, the original statements should be retained. In short, the taxonomy should serve as a guide—not as a master.

Learning Packages

INDIVIDUALIZING INSTRUCTION

A. Some Techniques for Individualizing Instruction

1. TEAM TEACHING: Two or more teachers plan together ways and means to help a group of pupils.

2. INDIVIDUALIZED HELP: Pupils work problems that are included in a particular topic, then check them against answers provided by the teacher. The problems that are not worked correctly are tried again and if they are still lacking, the teacher takes immediate steps to determine and correct the pupils' needs. To be effective, the classroom must be used by and with individuals, pairs, or small groups of pupils.

3. INDIVIDUALIZED ASSIGNMENTS: After a lesson presentation or development for a large group, the teacher, already knowing his pupils' capabilities and interests, places the pupils in activities aimed at helping them to succeed in these assignments at their individual rates.

4. PROGRAMMED LESSONS: Carefully written lessons, in which each small step is developed and illustrated, if geared to a child's reading or math level, can help him to catch up when he has missed a small portion of his work.

5. PUPIL CONTRACTS: For practice of a designated skill, the pupil follows a pre-arranged sequence of steps. This can be a set of instructions about which assignments to do, or it can be a check sheet where he indicated what he agrees to do.

   (Note Pupil Contracts and/or Programmed Lessons must be matched to pupils' needs, so that they will not degenerate into "busy work". They can be extremely helpful when they are well-planned.)

6. SPECIAL TUTORING: Done as pupil-by-pupil or pupil-by-adult, this technique is highly individualized. Sometimes progress is slow and barely noticeable, but the personal touch can help a child who has an emotional problem or some other hindrance for working with other children.

7. LEARNING STATIONS: Some laboratory classrooms are set up with special "Centers" or "Stations" for specific mathematical experiences. These places for Basic Facts, or Problems to Try, or Strengthening Computational Skills, or Games to Test skill, or many other mathematical experiences can go a long way in motivation, stabilizing, even evaluating pupil progress. Such a classroom as this must be well-stocked and well-planned for contunuous experiences at many levels.

INDIVIDUALIZED INSTRUCTION

DEFINITION

Individualized instuction is a process of gearing the instructional program to meet the needs, interest, and abilities of individual pupils. This instruction may be accomplished on a one-to-one relationship, in non permanent groups in varying sizes or through the involvement of pupils in independent study.

Individualized instruction is a broad approach in helping children to learn. It sets up flexible class environment, a creative learning climate, and provides opportunities for self selection, self direction, self pacing, and self evaluation on the part of the learner.

APPROACHES TO INDIVIDUALIZED INSTRUCTION

Identification of the needs, interests, and potential of pupils to be involved ih the program through observations, formal and informal tests, checklists, interest finders, sociograms, etc.

A broad knowledge of concepts, understandings, and skills to be developed, reinforced, and enriched.

Involvement of resource teachers, specialists, consultants, mobilization team member, librarians, and counselors in planning the individualized instructional program.

Use a wide variety of materials and equipment:

Books
Workbooks
Magazines
Newspapers
Pictures
Illustrations
Cartoons

Photos
Encyclopedia
Almanacs
Yearbooks
Charts
Graphs
Globes

Maps
Slides
Projectors
Viewflex
Listening centers
Tapes

Records
Radio
Television
Games
Pocket charts
Transparencies
Sara wrap
Portable chalk board

Setting up a procedure for operating and evaluating the individualized instructional program.

Establishing techniques and instruments for keeping records and measuring pupils' progress:

Checklists
Contracts
Conferences

Sign up sheets
Programmed materials

Teacher-kept records
Child-kept records

8. LEARNING PACKAGES: This technique is complete within itself for diagnostic, prescriptive, and evaluative assistance.

B. Common elements in all of these Techniques

1. The learner is freed from group pacing at some point to move at his own rate and/or interest.
2. The learner may use a diversity of learning media.
3. The learner will have one-to-one instructional interaction of varying periods of time with his teacher, a peer-tutor, or some other educational aide.

SUMMARY STATEMENT

All of us have used some form of individualizing instruction during our teaching career. For an instructional program to be effective, a combination of these techniques must be used.

LEARNING PACKAGES

I. An Overview

A. A learning package is a complete, organized, self-instructional unit of resources for one specific concept or skill (or a related group of skills)

B. A complete learning package consists of:
1. Clear indication of its subject
2. A statement of its purpose
3. A pre-test using criterion measures
4. Instructions and materials for small steps or progress
5. A post-test using criterion measures

(Note: Any package which contains only items 1 & 4 of the above can be an instructional packet)

C. A learning package should accomplish the following:
1. Tell the learner what he is to do and why
2. Let him do it with reasonable freedom of time and method
3. Tell him if he did it successfully

D. Who benefits from the learning packages?

1. Learning packages are for the learners who are at a stage of development in which they can help themselves. Every learner needs and benefits from this kind of independence if it is given to him wisely. It helps him to know himself as well as to help himself.

2. Learning packages also benefit the teacher by allowing him time to design each experience to fit the individual (or small groups of) learners. Also, the teacher can thus apportion his time and attention to the learners who need him most.

II. Procedures for Producing and Using A Learning Package

A. Select an objective from the Minimum Achievement Skills.

B. Write a post-test, which may serve as the pre-test, for diagnosis.

C. Write an outline of a sequence of instructions which provides for:
   1. Small steps of learning
   2. Motivating prompts or cues
   3. Practice and knowledge of results

D. Prepare materials with sufficient directions so that the learner can work through the package without additional help from you.

E. Administer the package to a few learners. If the objectives are not achieved, revise the package.

F. Talking with learners will help locate inadequacies in the package. Notes should be kept regarding development of the package and the history of the tryout, including student comments or other reasons for revision.

III. Keeping Records

A. Individual student folder
   1. Guide sheets or contract
   2. Remedial or drill work completed
   3. Chapters in textbook, if used, completed
   4. Related outside work

B. Teacher kept folder for each student
   1. Teacher-constructed tests completed by the student that show his weak or strong points.
   2. Samples of the student's work
   3. Notes taken during conferences with student
   4. Notes taken while observing student
   5. Reports of conferences with parents.
   6. Copies of reports issued to the parents
   7. Notes describing any special talents or physical disabilities (emotional or mental)

(Note: Each student should know what information is kept about him.)

IV. Summary Statement

A. On learning packages
   1. They are not the "answer" alone or within themselves as a technique in individualizing instruction.

   2. They do not take the place of developmental teaching by the teacher.

   3. All children are not at the level of independent, self-controlled work to benefit from this technique.

   4. Learning packages can be used for enrichment, as well as remedial purposes.

B. On individualizing instruction

1. The best and most effective instructional program may use a combination of techniques for individualizing instruction.
2. Since "variety is the spice of life", an effective program can be devised which will be both constructive and stimulating for both teacher and learner.

* * *

Guidelines for Constructing and Using Learning Packages

1. Assess the pupil's home background and interests.
2. Administer standardized and informal diagnostic tests.
3. Analyze the test results and record the data.
4. Select on the basis of the diagnoistic test information, those skill areas which need to be developed.
5. Write the learning objective, stating the desired measure of accuracy.
6. Construct the pre-test, and post-test.
7. Administer the pre-test and analyze the results.
8. Construct alternate learning paths or strategies to accomplish the learning objectives.
9. Determine the media for presentation.
10. Write the prescription.
11. Prepare two folders, one for the teacher andone for the child.
12. Have the child work through the sequence.
13. Administer the post-test to determine mastery of the objective.
14. Analyze post-test results.
15. Revise the learning system to either re-test or move on to the next skill level.

PREPARING BEHAVIROAL OBJECTIVES

When writing a behaviroal objective the object is to write objectives that communicate; therefore the following steps should be kept in mind:

First, indentify the terminal behavior by name; you can specify the kind of behavior that will be accepted as evidence that the learner has achieved the objectives.

Second, try to define the desired behavior further by describing the important conditions under which the behavior will be expected to occur.

Third, specify the criteria of aceptable performance by describing how well the learner must perform to be considered acceptable.

Three of the terms that will be used bear defining: Behavior........ refers to any visible activity displayed by a learner (student). Terminal behavior..............refers to the behavior you would like your learner to be able to demonstrate at the time your influence over him ends. Criterion.................is a standard or test by which terminal behavior is evaluated.

An objective is an intent communicated by a statement describing a proposed change in a learner-a statement of what the learner is to be like when he has successfully completed a learning experience. It is a description of a pattern of behavior (performance) we want the learner to be able to demonstrate.

A course description tells you something about the content and procedures of a course; a course objective describes a desired outcome of a course. Whereas an objective tells what the learner is to be like as a result of some learning experiences, the courses description tells only what the course is about.

A meaningfully stated objective, then, is one that succeeds in communicating your intent; the best statement is the one that excludes the greatest number of possible alternatives to your goal. Unfortunately, there are many "loaded" words, words open to a wide range of interpretation. To the extent that you use ONLY such words, you leave yourself open to disinterpretation.

Consider the following examples of words in this light:

Words open to many	Words open to fewer interpretation
to know	to write
to understand	to recite
to really understand	to identify
to appreciate	to differentite
to fully appreciate	to solve
to grasp the significance of	to construct
to enjoy	to list
to believe	to compare
to have faith in	to contrast

How can you write objectives that will describe the desired behavior of the learner:

First: identify the terminal behavior by name; you can specify the kind of behavior that will be accepted as evidence that the learner has achieved the objective.

Second: try to define the desired behavior further by describing the important conditions under which the behavior will be expected to occur.

Third: specify the criteria of acceptable performance by describing how well the learner must perform to be considered acceptable.

Use the following statements to test the clarity and completeness of your objectives:

1. Does the statement describe what the learner will be doing when he is demonstrating that he has reached the objective?
2. Does the statement describe the important conditions (given or restrictions, or both) under which the learner will be expected to demonstrate his competence?
3. Does the statement indicate how the learner will be evaluated? Does it describe at least the lower limit of acceptable performance?

INSTRUCTIONAL OBJECTIVES

Place an X before each objective which is properly stated.

___ The student will grasp the significance of the Treaty of Versailles.

___ The student has an attitude favorable to English grammar indicated by his response to a questionnaire.

___ The student will know 6 verbs.

___ The student will learn the names of the common tools in woodshop.

___ The teacher will list 3 major causes of the Civil War.

___ The student will know the important battles of World War 1.

___ The student will prefer cooking to sewing.

___ The student will correctly thread a sewing machine.

___ The student will pay attention as the teacher demonstrates the use of a drill.

___ The student will develop a sense of the cultural unity of man.

___ The student will list and describe the themes of 4 of Shelley's poems.

___ The child will develop an interest in leisure sports.

___ The student will give indications of a desire to learn more history.by volunteering to present an extra oral report.

___ The teacher will describe with understanding five concepts treated in the text.

___ The student will correctly solve 10 story problems.

___ The student will enjoy a record, "The Three Pigs".

___ The student will become familiar with the 4 kinds of sentences.

___ The student will construct a model of the earth.

___ The student will know the letters of the alphabet.

___ The student will contrast 2 objects.

___ The student will learn the rules of good safety.

___ The student will list 10 rules of good conduct.

CLASSROOM MANAGEMENT

WHAT IS IT?

1. Systematic organization of the classroom
2. Specified outcomes, procedures, and evaluation

HOW DOES IT WORK?

1. Specification of outcomes
2. Specification of procedures to achieve outcomes
3. Specification of evaluation techniques to measure success and failure

HOW DO I KEEP THE SYSTEM GOING?

1. Record goals on some regular basis
2. Revise individual and group goals
3. Institute a graph or progress chart for teacher and student

HOW DO I EVALUATE?

Measure real outcomes by expected outcomes

WHAT IS THE TEACHER'S ROLE?

1. Attend to individual and group progress records
2. Supply necessary feedback and instruction
3. Establish new "for fun" or enrichment group activities

WHEN WILL A CLASSROOM MANAGEMENT SYSTEM NOT WORK?

1. If there are no specified goals
2. If there is no record keeping system
3. If there is no evaluation procedures
4. If there is no teacher-to-student feedback

LEVEL 4 Sample Learning Package

I. *A. A. P. Objective: He can alphabetize words of newly acquired vocabulary by first, second, and third letters.

II. Behavioral Objectives:

A. Prime Behavioral Objective - Given a list of 10 newly acquired vocabulary words, students will alphabetize them by the first, second, and third letters with 100% accuracy.

B. Building-Block Behavioral Objectives

1. Given a list of 10 new vocabulary words, students will alphabetize them by the first letter with 100% accuracy.
2. Given a list of 10 new vocabulary words, students will alphabetize them by the first, and second letters with 100% accuracy.

III. Sample Pre-Test

A. Below are 20 words from our new unit in Geography. Look at them carefully, then put them in alphabetical order. Use the numerals 1-20 in the blocks.

________ cotton

________ Mississippi

________ plantation

________ gulf

________ floods

________ Jacksonville

________ rice

________ everglades

________ basin

________ Flordia

________ tobacco

________ Montgomery

________ delta

________ Alabama

---

* "Sequential Inventory of Reading Skills" K-9 70-71 Gr. - Study-Reading p. 14 #1

Sample Pre-Test continued.

________ Charlotte ________ peanuts

________ Reconstruction ________ Mobile

________ Georgia ________ Atlanta

On this test there is an opportunity to demonstrate skill in alphabetizing using the first, second, and third letters.

B. Below are 5 rows across of three words. Use the numerals 1, 2, and 3 to put each row in alphabetical order.

________ basin ________ rice ________ cotton

________ floods ________ gulf ________ peanuts

________ sugar ________ South Carolina ________ citrus

________ plantation ________ plains ________ peninsula

________ Montgomery ________ Mississippi ________ Mobile

The results of the pre-test should help the teacher determine which children need work mastering the Building-Block Objectives and/or the Prime Behavioral Objectives.

IV. Learning Paths:

1. Teacher led presentations using pictures, picture-word cards, word cards, etc.
2. Picture dictionary for levels indicated.
3. Practice Sheets for levels indicated.
4. Practice exercises for levels indicated, in Phonics We Use books D, C, E.
5. Match - O game and other games available.

V. Post - Test for Objectives and Directions

A. Building-Block Objective (A)
Put these words in alphabetical order by putting the numerals 1-5 in the correct blanks.

________ floods

________ Atlanta

________ delta

________ cotton

________ basin

B. Building-Block Objective (B)
Put these words in alphabetical order using the first two letters. The words are in pairs. Use the numerals 1 and 2 to show order.

a.__________ cotton __________ citrus

b.__________ sugar __________ South Carolina

c.__________ Reconstruction __________ rice

d.__________ peanuts __________ Planation

When 100% accuracy is attained, move to Prime Objective

C. Prime Objective
Below are 10 new geography words. Put them in alphabetical order. Use the blanks given:

Word List: plains, Mobile, Alabama, plantation, Albany, Montgomery, Flordia, Baton Rouge, basin, flood

1.________ 2.________ 3.________

4.________ 5.________ 6.________

7.________ 8.________ 9.________

10.________

5. What are some words or expressions used in Liberian English that seem to have no counterpart in American English (e.g., words or expressions concerning items or situations that one does not encounter in the U.S.)?

6. What differences do you notice in the way English is spoken by various groups of Liberians (i.e., of various educational, ethnic, and socio-economic levels) when speaking to each other, to someone from a different social level, and to foreigners?

7. What are the reactions of these various groups of Liberians to the use of Liberian English by foreigners (especially PCVs)?

A SMALL COLLECTION OF EXPRESSIONS FROM LIBERIAN SPEECH

2nd Edition

compiled by Tom Wheeler

printed by
University Printing Services
Eastern New Mexico University
Portales, New Mexico
December, 1979
Reprinted, December, 1980

EST COPY AVAILABLE

Preface

This collection is by no means definitive nor entirely original. Much of this effort is based on Warren d'Azevedo's Some Terms from Liberian Speech, published in 1967 by the U.S. Peace Corps in Liberia. During my own nearly twelve years in Liberia I had continuous opportunities to hear English spoken by Liberians from all social levels and in greatly varied contexts. From this experience I draw the examples and derive any nuances described herein. In many instances I have preserved Dr. d'Azevedo's scholarly definitions intact. These are marked (d'A.).

A word about any implicit sex bias: Finding myself privy more to the conversations of men than women when references were being made to the opposite sex, I have quite naturally collected a preponderance of expressions reflecting men's attitudes toward women. Although sensitive to the need for an equal treatment of women's attitudes toward men, I have had far fewer opportunities to be present in situations where such attitudes would reveal themselves. Rather than fabricate upon conjecture alone, I have preferred to cite references that are within the realm of my own experience. Perhaps someone could provide the necessary balance who has had complementary experiences in listening to the speech of, and interacting with, women as they talk about men.

This collection makes no claims at being complete (indeed, Dr. d'Azevedo's now out-of-print booklet cited a greater number of words, many of which are more anthropological in nature than the bulk of expressions appearing here). The purpose of this glossary is specifically to acquaint Peace Corps Volunteers being trained for service in Liberia with some of the words and expressions they will be hearing. What is perhaps more important is the development of an awareness of the great diversity of English spoken in Liberia and a sensitivity to what particular registers or levels are appropriate in which contexts. To this end there is, following the glossary, a guide for focusing such observations.

Recognition must go to Prof. Warren d'Azevedo whose earlier work has provided the foundation for this revision. Likewise, I wish to express a sense of profound gratitude to Fr. Tom Mercer of Voinjama, whose lengthy service in Liberia as an Episcopal priest and English teacher, substantiated by professional linguistic training, makes him perhaps the most acknowledged authority on the linguistics of Liberian English. Finally, I am unquestionably indebted to my many Liberian friends from whose conversations these examples have been garnered--not in the sense of exploitation but rather one of sharing. An especial thanks goes to Alfred Larmouth, Jacob Karnga, and other members of the Liberian language training staff during the agriculture/rural development Peace Corps training program of the summer of 1979, who made specific comments and suggestions about the words, expressions, and examples contained in this particular revision. Their eagerness to assist increases the validity of such a document. I regret any errors that are misperceptions on my part.

To those Volunteers who may use this collection, then, I hope it provides some foundation for your own continued learning as you encounter the rich diversity of experience and proud heritage in Liberia.

Tom Wheeler
Portales, NM
12 December 1979

Communications in Liberia (English)--A Guide to Observing

English is the most widely spoken language in the world. Although there exist standards of written and spoken English, most people communicate with each other using colloquial forms not always considered standard. Colloquial English is influenced by various linguistic forces, including other languages that are spoken in the area. As a result, speakers of English who are from different places often have to pay careful attention to each other's pronunciation, inflection, vocabulary, and idiomatic expressions if they want to communicate effectively with each other.

In addition to listening carefully to the sounds of each other's English, it is also necessary to pay attention to gestures and other nonverbal cues that also affect the meaning of messages being sent back and forth between speakers.

The following questions should help you focus on some of the differences between Liberian and American English and thus help increase your understanding of English as many people speak and communicate with it in Liberia.

1. How do people greet each other? (What do they say and do?)
2. What expressions do people use when:
    a. getting attention
    b. giving directions
    c. making requests for themselves
    d. making requests for others
    e. apologizing
    f. expressing sympathy
    g. giving approval
    h. expressing disapproval or dissatisfaction
    i. expressing indifference
    j. gossiping about others
    k. abusing/maligning a third party not present
3. What are some expressions that are common to both Liberian and American English? Do they mean the same thing in both?
4. What are some of the features of the way Liberian English is pronounced that makes it different from American English?

EST COPY AVAILABLE

white thing	a traditional gift or token o respect and good intentions (d'A.)
witch	sorceror; sorcery. This English term is used very loosely to include all those persons and practices which involve magic with evil intent. But it is used by many tribal peoples with specific reference to equivalent terms in their own languages. The concept of "witch," to most persons in Liberia, connotes a special kind of evil spirit with which certain people are born, or which may enter a person and use him or her as a host. Such a spirit controls its host and forces him or her to do destructive things, such as bringing sickness to others, ruining crops, eating unborn babies and human souls. The witch spirit may leave its host while he/she sleeps and wander about doing terrible deeds. To say someone is a witch really means that he or she "possesses" or "has" a witch. To "make witch" means that one is using the services or powers of a witch to do harm to others. To "have witch on one" means to be the target of a witch's evil intent. To "catch witch" is to discover and trap a witch through counter-magic. (d'A.)
witness (wisneh)	see. "You witness the kung fu pictures?" (Did you see the show?)
yah?	Did you hear me? (Do you understand what I've just told you."
yana boy	street peddlar. A petty trader who carries his wares about the town.
your	also means you (plural); y'all. "What time your came?" (When did y'all get here?) "Your must clean the place before leaving."
zute/zoot	to dress up. "On Christmas and the 26th [illegible], you can see everybody zooting." (Everybody puts on his/her best and walks around town.

BEST COPY A

A SMALL COLLECTION OF EXPRESSIONS FROM LIBERIAN SPEECH

compiled by Tom Wheeler (December 1979)

abuse	to malign with offensive language. The word means much the same as in American usage but is probably used with greater frequency in Liberia. "The man abuse my ma!" (He said something uncomplimentary about her—a grievous insult in Liberia.) "Teacher, Boima abuse me-o!" (Perhaps Boima called him/her a damn fool.)
again	1) after all. "You not going again?" (So you decided not to go after all.) It does not mean going for a second time (which, if it's for food or drink, would be, "You going for round?"). 2) now; this time. "What happen again?" (Now what's the matter?) 3) any more. "I can't do that one again." (I don't do that any more.)
ass-trick	nonsense, foolishness. "That man good-good job spoil on ass-trick." (He lost a very good job for some foolish reason.)
ba	friend. "I say ba, what time you going in town?"
baby ma	a woman who has a young baby. Can also be used as a form of address. "Take time with that girl—that baby ma-o!" (Stop flirting with her; she has a young (nursing) baby and therefore is not interested in making love right now—or shouldn't be!) "Sarah Ma, yeah the food what my ma sent you." (Mother of Sarah, here's the food my mother has sent to you.)
bad kinda way	in the worst way. "I want wisneh the picture bad kinda way, but no money, Jack!" (I really want to see that movie, but no way, José!)
balance	the remaining portion "These pekins will eat the balance rice." (The small children will eat what's left over.)
beat up	of poor or disappointing quality. "The people party was too beat up." (A flop)
beg	to solicit or plead. "I beg you!" (Pretty please.)
behold	alas. "I thought we fini' fixing the palaver, behold the woman still vex with me!" (I thought we had settled our differences; to my surprise, she's still made at me!)
boko	a deaf mute
boney	a small, common fish that has a lot of bones but is otherwise delicious. The dried (smoked) boney is used to flavor stews and sauces.
book	1) to know book means to be formally educated (regardless of the level of education). "That sabby woman; she know plenty book." (That's a very intelligent woman; she's well-educated.) 2) as a verb, to catch, write up, or penalize somebody for an offense. "The officer book the taxi driver—no license!" "The principal book the children for disturbing the program."
born	1) to give birth to. "Hawah born a boy child." 2) true genitor. "He my born pa." (He's my real father, not my step-father or guardian (who would also be addressed as "pa").)

AILABLE

boron	a small cheat sheet, concealed in one's pocket, up a sleeve, or under a thigh. Teacher to students: "I know none of your can pass except for boron." (Cheating is the only way most of you will make it through this course.)
bra	brother, friend. "I say, bra, you hear about the new picture?" (My good friend, have you heard about the new movie in town?)
bug-a-bug	termites
bullshit	in common use and not considered particularly offensive. "Let me go bullshit those girls small." (impress them with my ways) "That so-so bullshit the man talking." (Don't believe a word he says.)
business	matters, concerns. "That your business!" (A common response of indignation when a request has been refused.) "That not small boy-o! He know woman business." (He's not a child; he has slept with a woman before.)
butter pear	avocado
can/can't	to do something habitually. "My pa can make farm." (My father is a farmer.) "I can't eat hog-o!" (I don't eat pork. A religious taboo among Moslems.) Can and can't are likely to be pronounced alike except for an important difference in tone: "I càn do it." (low tone on can) = I usually do it. "I cán do it." (high tone on can) = I usually don't do it.
cane juice	locally-made rum
carry	to take along. "Carry this letter to your pa." (Take this to your father.) "When you go to the States, you must carry me-o!"
cartoon	a box or carton
chakla	confusion; to cause confusion; to be mixed up. "The man full of chakla." (He likes to cause trouble.) "Everything here chakla." (Things are not going according to plan.)
charge	1) to fill up. "Charge my glass." (Fill 'er up!) 2) to search. "The police charge(d) the rogue's pockets." (looking for something stolen)
charged	intoxicated. "The man charged in the head."
children	also refers to adolescents and young men and women who are in school (including senior high school and college); usually used to refer to one's schoolmates. "To get those children to clean up after the party ain't easy-o!" (comments made by the party chair about her 12th grade classmates.)

BES

them	and all the rest of the people. "Carry these bananas to your ma them." (Take them to your mother and the other people in her house.)
tie one's face	to frown or scowl. "Pekin, how you tie your face so?" (Did somebody make you mad?)
tight	of small but wiry build. "The man you talking about, he tight?" (Is the man you're describing to me rather short with lean muscles?)
toilet	(v) to defecate. "Ma, your baby now toilet-o!" (He/she has just soiled the diaper.) (n) feces. "Mary, come move the toilet from here." (Come clean up this mess your baby brother just made on the floor.) restroom. "Teacher, I want go in the toilet."
topugi	a potash or soda obtained from ashes of certain plants or from mineral deposits. It is often used when sea salt is not available, but provides a flavor accent of its own, which is relished particularly among the Lorma people. (d'A.)
torch	flashlight
tote	to carry (a load)
use	to take advantage of. "The teacher really use(d) these children." (He probably took advantage of his to berate the students, or to make do a lot of extra work.)
vexed	annoyed, angry (very common word)
walkabout	stroll; promenade. "What place you going?" "I go walkabout." (I'm just going to stroll around the town.) Can also suggest looking for company of the opposite sex. "Let's walkabout to Hawa's." (Let's go visit her.)
wa' ple?	what place? = where. "Wa' ple you stay?" (Where do you live?)
waste	to throw away or accidentally spill. "Oh! How you wasted water on me so?" (You splashed me when you threw out the water.) "The rice waste-o!,, my people!" (Somebody knocked it (the pot) over.)
wata police	prostitute
waterside	waterfront. That part of a village or town which is along the water--usually a marketplace, quarter, or boat landing.
wa' time?	what time = when. "Wa' time you came? (When did you arrive?)
wa' ting?	what thing = what. "Wa' ting you talking?" (What are you talking about?)
what to do?	that's life; c'est la vie. Nothing much you can do about it. Often said with a gesture of clapping the hands once and then opening them, palms up.

COPY AVAILABLE

speed	self-confidence; assertive flattery. "The way he got that job—the man got speed-o!" (He sweet-talked his way into it.) "If you want that girl, you must run your speed-o!"
spend	to pass the time. "How you spend the night?" (How did you sleep?) "I going to spend time to my auntie them." (I'm going to visit my aunt and her family for a few days.) to spend money. "That man can spend-o!" (He's not stingy.)
spoiled	broken. "My watch spoil-o!" (It's stopped for good.) "How you manage to spoil the people car?" (What did you do to wreck their car?)
spy	to catch a glimpse of. "I spy her in the store." (I saw her in the store--but didn't get a chance to speak to her.) to cheat. "Teacher, Joseph want spy my paper-o!"
stick	refers not only to small, slender pieces of wood but can also indicate a log several inches in diameter
story	fabrication, lie. "That story, yah!" (I don't believe you.) Not as accusatory or inflammatory as, "That lie, yah!" or "You lie!"
straight	right away. "When he spy the cat eating the fish, he chunk it straight!" (As soon as he saw the cat eating the fish (that they may have been drying in the kitchen), he hit it with a rock.)
stranger	guest
stranger father	host
sweet	delicious. "Gbasa jamba sweet-o!"
suck one's teeth	to make a hissing sound by sucking against the teeth. A serious insult.
take time	watch out; take it easy; be careful. "Take time for the dirty water." (Watch out for that stagnant drain water.) "Take time with the people daughter." (Don't get her in trouble.)
thank you	in addition to expressing appreciation for a gift or favor done, it can also mean I'm happy for you; that's fine; congratulations; your're welcome; I'm glad; etc. "Thank you for your new lappa." (What a pretty lappa you have! (does not mean that the lappa has been given to the one saying thanks).) "Thank you for your new baby." (Congratulations.) I hear you passed your examinations . . . Thank you!"
there	"I not there-o!" (I was [illegible] not involved in any
too; too much	very. "My friend too good to me-o!" (He has done well for me.) "That man fat too much!" (He's huge.)
time	"Time he was to the country, ..." (When he was living upcountry, ...) "Once upon a time ..." (Response: "Time!") The way tales begin in Liberia.

chunk	to throw at. "You see the children chunking the keke?" (Look at those kids throwing rocks at that emaciated dog!) "When we fini' with this work you must chunk us-o!" (You'd better give us something good.)
citizen	A name jokingly given to dogs, especially when they sit in the road, unconcerned by traffic
civilized	also called kwi. Refers essentially to religion (usually Christianity) and education (usually western style, that is, European or American, which would also include a person who has graduated from high school or college in Liberia). The terms "civilized" and "not civilized" are used extensively in Liberia and imply a practical cultural distinction rather than an invidious one. (d'A.)
cold water	a gift to sooth ruffled feelings, to appease anger, or to ask forgiveness. "Now that we fini' talking the palaver, where my cold water?" (Now that I have agreed to a compromise (or have helped you people reach an agreement), show your appreciation.)
come	"I coming." (I'm going but will be right back.) "I coming to go." (I'm about to leave now.) "Go come." (Come back later, or Hurry back.) "I come to you-o!" (I'm here to ask you for a favor.)
come let's each rice!	a customary invitation to join in eating. Liberians will always extend this invitation regardless of the size of the group or the quantity of food. If one has already eaten or otherwise does not wish to partake, he or she says, "Thank you" which means "no thank you." Or, in order not to offend those who extended the invitation, the invited person may eat one token spoonful of the food and then say "thank you."
congo	A term originally applied to "recaptured" Africans—those slaves rescued from slaveships during the period of the British and American blockade of the West African coast early in the 19th century, and released at Freetown or Monrovia. In that many of these recaptured people were from the Congo region, this word became a general reference to such persons, who were destitute, defranchised, and helpless. During the early years of the Liberian colony, large numbers of refugees of this kind constituted a serious problem to the government. For the most part, they developed into a class of uneducated laborers and tenant farmers, looked down upon by colonists and high-status tribesmen alike. Except in some rural areas, their descendants today are indistinguishable from other members of the coastal urban population, and many leading Liberian citizens have "Congo" family backgrounds. In many sections of the country the term still has derogatory implications—both as an epithet and as a snobbish class distinction. (d'A.)
country	tribal or traditional, referring to native or indigenous customs. "country doctor" (a herbalist or bonesetter) "That big shot got three country wives." (Besides his 'civilized' wife he has some other wives for whom he may have paid dowries in the traditional manner.)

BEST COPY AVAILABLE

* cut	to break or tear. "The rope cut!" (The string broke.)
cutlass	machete. One of the most general and important implements in the interior. (d'A.)
cut throat	to gain by outwitting a rival. "I was loving that girl but my best friend cut my throat." (He won her away from me.) "That man going so cut my throat for the job in the Ministry." (That man over there did something so that the people hired him instead of me.)
dash	a tip or gift; to give something to someone in return for a favor. "Dash" does not imply anything like the word "bribe" (see "knock belly") but rather indicates reciprocity, recognition of a favor for service done, or the worth of the person being "dashed." In some tribal languages the term for such a token gift means, literally, "respect." It is an indication of the esteem or satisfaction one has with regard to a person who has rendered a service or who is being asked to do so. (d'A.) "Mommy, since I buy plenty fish from you, you must dash me one fish-o!" (customer to a market lady: Since I gave you a lot of business--and thus you don't have to stay as long in the market until all your fish are sold--you should give me another fish as a sign of appreciation.)
dear	expensive "Pepper too dear this time." (The price of pepper has gone up--as it usually does during the dry season.)
devil	any masked dancer or performer, whether for entertainment or ritual. Not to be confused with the Euroamerican concept of "devil," "satanic," or "evil," though this is the way the term was applied by early missionaries and other travelers to Africa. When a Liberian speaks of "devil business," he means something sacred or mysterious connected with tradition. It is still in common usage among English-speaking peoples of urban and rural Liberia, but there is an increasing avoidance of such terms by sophisticated Liberians--particularly those who are developing a renewed pride in their traditions, having had an opportunity to see them more objectively. It is best to learn the specific local names for any ritual figures and to refer to these respectfully by these names. It is also important to know that many of these figures are primarily "entertainers" and that others are considered to represent sacred spiritual entities. The boorishness of tourism is no less evident under these circumstances than if one were to refer to the Roman Catholic pope in his vestments as a "god," to the Christian crucifix as an "idol," and to sacramental wine as "booze." Conversely, it is just as naive to refer to a costumed clown or other entertainer as a "witch doctor," "priest," or "magician." (d'A.)
different-different	varied; many kinds. "The people fix different-different food at the feast." (There was a great variety of food prepared.) Repeating a particular word is a common means of intensifying its meaning.

BEST COPY

sassywood	a concoction made from the bark of the Erythrophlacus guineensis. The term may be derived from the English "sauce". Used as an ingredient upon which oaths are sworn, and as an ordeal in cases of litigation. The term has come to be a general reference to all ordeals involving a potion taken internally. (d'A.)
scoobies	low-back tennis shoes
scrapehog	a pejorative term for white people
self	even (used for emphasis) "The man never came self." (He didn't even show up.) "That one self small." (Even that one is too small.) "You self you know that woman cracky." (Even you know that that woman is a bit tetched in the head.)
sister/ brother	prefaces a name as a form of address for an older brother, sister, cousin, or associate. "Brother Jacob, please give me small rice." (A person younger than Jacob is making this request.)
sit down good	This means "Squeeze over. Let one more person get in the taxi."
sizeable	physically mature. "He not pekin again, he sizeable boy." (He's no longer a child; he's a big boy/young man now.)
skates	high-back tennis shoes
sleep	also refers to something left out overnight. "Oh! The rice slept in the pot-o!" (Somebody forgot to put it away.) "The cassava must sleep for two-three days under the water." (Keep the cassava in the water for a few days until it ferments (for making fufu).)
slippers	rubber thongs or sandals
small	a little. "Wait small." (Hold on a minute.) "The water coming small-small." (Just a trickle.)
small boy/ small girl	a child; an inferior or unrecognized person. "You think you know this place? You small boy!" (You don't know all the ins and outs of this place and the people who work here like I do.)
so	this way/that way. "The man went so." (He went that-a-way.) "Where's the chief?" "He so." (Over there.) "Let it be so." (Enough!)
so-so	1) neither good nor bad. "How you feeling?" "So-so." 2) lots of, nothing but. "So-so bones in the soup." (Lots of bones.) "So-so red marks on my card." (Lot's of F's on my report card.)
Something	"Where my something?" (Where's the thing you said you had for me?)
sometime	perhaps. "Let go see Hawa. Sometime she having small food for us-o." (Maybe she'll have something to eat.)

VAILABLE

Poro	the general term for the compulsory fraternal associations, known as the male secret societies, in many of the tribes of central and western Liberia, as well as in Sierra Leone, Guinea, and Ivory Coast. Each tribe has its own name for this organization. It should not be confused with many other types of secret societies which may also exist in the same region. (Compare Sande.) (d'A.)
Poro bush	the sacred grove of the men's secret society where boys are trained and initiation rites take place. (d'A.)
pregnant	(v) to make a woman pregnant. "That the boy who pregnant that woman daughter." (He's the one who got her daughter pregnant.)
prop	to pad one's rear end by wearing more than one pair of trousers.
punk	sodomist
raccoon	a civet
rascal	tricky, deceitful, crafty. "You see how the man can talk one thing and do different thing? He too rascal!" (He doesn't practice what he preaches.)
reach	to arrive. "What time you reach Monrovia?" (When did you get there?) to be enough. "The money can't reach-o!" (My money is insufficient.)
rice crust	the toasted rice that sticks to the sides and bottom of the pot after cooking. Highly prized by children, who stand about the fire waiting for the emptied pots. Very much the same as "pot lickin's" or "licking the bowl." (d'A.)
rogue	thief. Thievery is a major crime among most of the tribal peoples of the interior, and thieves are punished severely. The cry of "rogue, rogue, rogue" may also be heard frequently in towns and cities, where crowds will follow an apprehended thief to jail, shouting abuses and calling attention to his/her crime. (d'A.)
rope	any piece of string, strip of cloth, or a vine
Sande	the general term for the compulsory sororal associations of female secret societies, which exist among many of the tribes of Liberia as well as in Sierra Leone and Guinea. The term Bundu is also heard, but this is used mainly in Sierra Leone among the Mende people. (Compare Poro.) (d'A.)
Sande bush	the sacred grove of the women's secret society where girls are trained and secret rites of initiation take place. (d'A.)
scapo/sarpo	a type of scouring pad made from the fibers of a gourd (sim. to excelsior)
sassy	full of energy, frolicsome. "That dog too sassy!" (a playful dog)

divide	to distribute or share. "Who divide the cards?" (Who dealt this hand?) "I must divide the rice?" (Should I go ahead and dish it out into each person's bowl?)
dako-flesh	used clothes
dry	sickly, undernourished, skinny. "You looking dry this time." (You've lost a lot of weight.) Not a compliment.
dress	(verb) move over. "Dress small, old lady." (Move over so one more person can squeeze into the taxi or pickup.) (This particular expression is not a comment on the woman's attire!)
dumboy	boiled cassava pounded into a thick, viscous dough, served in a bowl covered with soup, or squeezed into a balland dipped into the soup. (d'A.) (Compare fufu and gogba.)
ease oneself	to urinate or to defecate. "Teacher, I want go ease myself."
eat	besides the usual meaning, this word also means to embezzle. "The tailor ate my change-o!" (The tailor didn't give me my change.) "The carpenter ate the balance zinc from me." (He kept the rest of the roofing material—which I had bought—for himself.)
eddoe	the tuber of the Colocasia esculenta or Xanthosoma sagittifolium. Known elsewhere as cocoyam or taro. It is cultivated and eaten in Liberia as a "potato." (d'A.)
embarrass	to inconvenience; to be an obstacle to. (This is one of the early Middle English meanings of this word.) "Those children outside are embarrassing us, teacher." (They're probably making too much noise so that the students can't hear their teacher.) "That chair embarrassing the door. Move it!" (It's in the way.)
ene?	Is that so? Probably contracted from "Ain't it so?"
ever since	Some time ago; already. "I wash the clothes ever since." (I've already gotten that task out of the way.) "That girl been in the city ever since." (She's been living in Monrovia for a long time now.)
except	unless. "You will not get your check on time except you run behind it." (You yourself have to see that all the papers get processed if you want it in time.)
fine	satisfactory, good, beautiful. "That woman fine-o!" (She's very pretty.) "I see you fix your new room fine!" (You've done a good job painting and decorating it.)
fine time	having fine time: often implies lovemaking. "My girl and I were in the room having fine time."

ST COPY AVAILABLE

finish	to run out; to have completed a task; to be broken; to be completely out. "The money finish." (No more money.) "My watch finish." (My watch has broken.) "I will soon finish washing my clothes." "The chair fini' breaking." (The chair has broken.) "The man fini' cheap!" (He's stingy as hell!)
flash	splash. "Uh! The pepper water flash in my eye-o!" (He/She may have just mashed a boiled pepper and got a squirt in the eye.)
foot	the whole leg. "He left small to broke my foot!" (He almost broke my leg.)
for true?	Is that right? "The President coming here next week." "Oh, for true?" really, actually, a fact. "The man sick for true." (You're right, he's really sick.)
for what?	why? (often said with a peremptory tone of voice) "I coming to beat you-o!" "For what?" (Don't kid yourself.)
fresh cold	a common cold, no matter how long one has had it. "Fresh cold giving me hard time." (I've had this cold for some time now.)
fresh milk	canned milk. "Please give me one tin fresh milk."
frisky	impertinent, insolent (does not mean frolicsome). "That small boy too frisky!" (He's not behaving properly in the presence of elders or other social superiors.)
fuck	not the powerful obscenity it is in the U.S. It's common to hear respectable people in seemingly polite situations say, "He fuck up!" meaning things did not work out as he had planned. This word is often spelled "fork" on walls, school desks, and in buses.
fufu	a thick dough made from cassava that has been grated or beaten and fermented. After being cooked, it is rolled into a ball and covered with a soup. It is swallowed without being chewed. (d'A.) (Compare dumboy and gogba.)
full	(adj) ripe. "The rice not full yet." (It'll be another couple of weeks until it's ready to be harvested.) high. "The water full-o!" (The rivers and swamps are high.) (v) to fill up. "Full my glass."
gari	coarsely powdered cassava that has been grated, dried, and toasted. It can be eaten with sugar and milk or rehydrated and served with a soup or sauce--as rice is served. Also called farina.
glassa jamba	cassava leaf (in the Vai language)--particularly a sauce made of the leaves from the cassava plant, which have been beaten in a mortar, cooked with fish, meat, or chicken, red palm oil, pepper, and other ingredients such as beans, okra, or other greens. Served over rice. Sweet-o!

BEST COPY

overplus	excessive. "Time we went to the feast we ate overplus." (When we went to the festival, we stuffed ourselves.)
own	worth. "How much groundpea you want?" "I want ten cent own." one's portion. "Gimme my own of rice." real, actual. "That my own pa." (That's my real father, not my guardian.)
palaver	discussion, argument, trouble (derived from the Spanish word palabra, word) (d'A.)
palm butter	The thick, oily gravy strained from the pounded pulp of the palm fruit ("palm nut"). When mixed with pepper and meat, it makes a much relished "soup" to serve on rice. (d'A.)
palm oil	a bright to dark red-orange oil extracted from palm nuts (fruit), used extensively in cooking. It can be "clarified" by heating.
palm wine	The sweet sap of the raffia and oil palms, collected from a cavity cut into the heart of the tree. The sweet--and lightly fermented--sap is called "woman's palm wine." The more sour--and more strongly fermented one is called "the man's own." The fermentation occurs by natural yeasts. (d'A.)
part	that which belongs to somebody. "Is this my part of rice?" (Is this the rice you reserved for me?) "You part, you full of foolishness." (As for you, your full of foolishness.)(In this context, usually said in jest.)
pass water	to urinate
past	to a greater degree than. "That man big past me." (He's taller or larger in size than I.) "This food sweet past the other one." (This food is more delicious than that.) "That lock small past my own." (That padlock is smaller than the one I have.)
peepee/piss	to urinate (commonly used and inoffensive) "I coming. I want go peepee." (could be said by anybody from a small child to a grown man--or woman)
pekin	small child or young adolescent boy
pellie	good friend, one with whom one has had some pleasant experiences. "I know the Boima too well. That my pellie." (I know the Boima you're talking about. He's one of my best friends.) "Pellie, let's go walkabout!" (Let's take a stroll around town and see what's going on.)
plenty	a lot; many; much. "Plenty pepper inside!" (The food's hot!) "The women plenty in that town." (Lot's of women there.)
poo-poo	excrement; act of defecation "So-so poo-poo on the road!" (Many people have been relieving themselves at the side of the road.)

VAILABLE

438

medicine	an object (fetish) or practice (ritual) intended to control supernatural powers for desired ends. "Somebody made medicine against me." (A frequent explanation for otherwise unexplained failure, sickness, or death.) Also called "African science." (J'A.)
meet	also means to find, to come across, to see. "When I reach, I met the people already in the meeting." "I went to your place last night but I never met you." (You weren't home.)
move	get away from. "Move from my face." (Get away from me. Probably a literal translation from an expression in the indigenous languages that means, "Get from in front of me." "Move from there!" (or "Move there!") (Get away from there—either you might disturb something or might get hurt.)
must	please(do) "My ma say you must send her ice." (My mother asks that you please send her some ice.) Should. "I must come?" (Should I come?)
myself	me, too/ me, neither. "My friend can't eat black deer. Myself." (I don't eat it either.)
no mind, yah!	an expression of condolence suitable for soothing a crying child, sympathizing with somebody who has been injured, or comforting a bereaved person.
nothing strange no bad news	a response to the questions, "What news?" or "How you keeping?"
now	(adv) just. "The chief now come." (He has just arrived.) "I now eat the whole thing!" (I just got through eating all of it.)
nut	also means penis (not testicles)
-o!	used at the end of a statement for emphasis (where Americans would indicate emphasis by giving additional stress to the particular word, a practice that might alter the meaning of the word for language-tone-sensitive Liberians), also, "To be warned!" (T. [illegible]) "The teacher coming-o!" (Better stop comparing answers.) "I don't go for it-o!" (I don't like what you're doing, i.e., keep your hands to yourself.)
on/off	(v) "On the light." (Please flip the switch.)
old man old woman	address of respect for older—and not so old—persons. "Old Man Varney, morning-o!" (greeting the gentleman)
one-one	a little bit; small-small. "I can hear Bassa one-one." one by one. "One-one person can see the doctor-o!" (The doctor sees patients individually.)
one time	at once; right away. "You must clean the fish one time." (Does not imply number of times.)

BEST C

gegba	a thick, viscous cassava dough similar to dumboy but much harder. Small pieces are twisted off a larger ball with the fingers, dipped in soup, and swallowed without chewing. A favorite of the Mano and Gio tribes. (Compare dumboy and fufu.)
go back	also refers to the death of an infant or very young child. "My wife deliver eight babies but four went back." (My wife has had eight children but four of them died before they were two years old.) This expression reflects the common belief that one's soul is waiting somewhere with other souls for the chance to get into the world by way of a new pregnancy. If the particular body that the soul has entered doesn't make it in the world, the soul returns to the waiting place for another chance.
gogbo/gorgbor	the last few drops of liquor in the gourd or bottle. He who takes the gogbo must supply the next round. "Ma! Don't give me the gogbo-o!" (I'm not prepared to offer a round of drinks.)
grona	a street urchin; orphaned; irresponsible, delinquent. (Apparently from the Sierra Leone Krio meaning "grown up" and refers to children and young people without families, living untended in the city. d'A.) "When you walk downtown, you must take time for those grona boys-o!" (Watch out for your wallet/purse and wristwatch.) "Big man like that, he too grona!" (As important as he is, he is, he often acts irresponsibly.)
groundpea	peanut, groundnut (British)
half-way	part way. "Let me carry you half-way." (Since you're on your way now, let me walk with you a little bit (usually to the edge of the town).) "Come leave me half-way." (Walk with me as I set out on my journey.)
hang head	meeting, private talk. "Okay, we will hang head and let you know." (Wait outside while we talk over the problem you have brought before us.)
having	have. "I'm having only ten cents."
hear	to understand. "I can hear Kpelle one-one." (I understand a little of the Kpelle language.) "You hear?" (Do you understand what I just said to you?) This is often contracted to "Yah?"
heart lie down	to be satisfied. "The thing you talking make my heart lie down." (I feel very good about what you've said.)
humbug	to tease or bother. "This Peace Corps man been humbugging me all night, officer!" (Avoid such a situation.) inconvenience, trouble. "Plenty humbug here." (Things are not working smoothly.)

PY AVAILABLE

in front	ahead, beyond "Go in front." (Go ahead of me--I'll be along in just a minute.)
I say...!	Listen! Do you hear me? common preface to a question, a pronouncement, or a request for attention. "I say,...who working here?" (Who's going to wait on me in this store?)
jina	spirits. Widely used among Liberians to refer to any natural spirit or supernatural entity. Apparently derived from the Arabic *jinn*. Also refers to familial or guardian spirits. (d'A.)
juke	poke, puncture; ruin somebody's (perhaps illegitimate) chances. "She juke inside the snake hole with a long stick." "That woman husband really juke me for that job-o!" (He interferred with my making a deal with someone to get the job.)
just now	right away. "I coming just now." "That just now I come-o!" (I *just* got here.)
keke	a malnourished, flea-bitten puppy or dog
kitchen	any roofed-over, but open structure used for cooking *or* for meetings and receiving visitors. (d'A.) or for ~~[illegible]~~ purposes
knock belly	a colloquialism for doing a favor or giving a gift as an inducement for a requested service (i.e., a bribe) (d'A.) "You want me to fix your check before time? You must knock my belly-o!" (Cough up.)
kola nut	the nut of the *Cola nitida* and other species of kola tree cultivated throughout West Africa. Between five and ten nuts are clustered in the large green pod of the tree. Along with salt, gold, and slaves, the kola nut was an important part of the ancient trade between the coastal forest areas and the peoples of the high interior savannah. It is highly prized for its taste and stimulating effect. It is chewed during work and on long treks and is said to diminish appetite and increase energy. Kola nuts also have a ceremonial and ritual significance: White kola nuts are symbols of friendship and purity of intention, and are used in gift-exchange as well as in sacred ritual. A red day may also be made from kola nuts. (d'A.)
kro-kro-ji	crooked, deceitful, sneaky. "He play kro-kro-ji." (He achieved his goal by less-than-honest means.) (d'A.)
kuu	an indigenous agricultural cooperative whereby all the townspeople work one person's farm, then another, until all have been prepared or harvested.
kwi	a term widely used among tribal peoples to refer to all foreigners, or those who have come from across the sea. It includes the descendants of Liberian colonists as well as Americans and Europeans. It has also come to be applied to all "civilized" or urban people who dress and behave in a non-traditional manner. (d'A.)

lappa	a piece of cloth about two yards long. It is also a measurement of length for cloth. It is the common attire for women when wrapped about the waist and tucked in as a long skirt. (d'A.)
last time	before; the other day. "I gave it to you the last time." (I have already given it to you.)
lay	to run away; escape. The rogue grab the man watch and lay." (He was gone in a flash.)
leave	let go of. "Leave me!" (Hands off!) "Leave my hand!" (Let go of my arm.)
law	also means a taboo, or prohibition sanctioned by supernatural agencies and supported by ritual. "We can't eat black deer-o!" (It's our family taboo that we do not eat black deer.)
let it be so/ let it stay so	that's enough. Stop. (When something is being measured out, e.g., food, drink, a series of complaints, or a homework assignment.)
like that	approximately, around. "I will come to your place 4 o'clock like that." (may show up at 6 or 7 o'clock.)
load	baggage, things carried. "Who will tote my load, now?" (Who's going to give me a hand here?)
long	tall. "This man long past his brother." (He's taller than the other person he's with.)
loving to	to be a lover. "I want to be loving to you." (I'd like for you to be my girlfriend/boyfriend. Implies a sexual relationship.)
ma	a term of respect for any older woman (including one's mother). To abuse one's mother is the most powerful insult in Liberia.
make farm	the entire process of preparing a plot of land for farming, including the planting of potential crops.
make market	to sell goods (produce, dry goods, baked goods, etc.) in the market place, in front of one's house, on the road, or from a container carried around on the head. "My wife making small-small market this time to help with the food business."
manage	to be able. "How you manage to know?" (How did you find out?)
mean	(v) to wrong somebody. "Teacher Davies mean me with that grade." (He gave me a lower grade than I think I deserved.)
meat	wild game. "That the Peace Corps man meat." (That's the PCV's pet--i.e., some mammal other than a domestic one--for instance a deer or a "racoon" (civet).)

BEST COPY AVAILABLE

FOLLOWING DIRECTIONS

1. Write your name in the upper right-hand corner. Circle the first and last letter. Write the date under your name.
2. Write your name on the line in the lower left-hand corner.
3. Write your first initial and your last name above the box in the upper left-hand corner.
4. Write your initials in the circle. Underline your last initial.
5. Write your name in capital letters in the boxes in the lower right-hand corner. Use one box for each letter. Color in any empty boxes.
6. Write your last name down the left-hand side and your first name down the right-hand side of the paper. Number each letter in your name.
7. Write your last name to the right of the X. Cross out every other letter.

Teacher option: Have student follow oral directions to
complete a task __________
go to a location __________

X

○

First name										
Middle name										
Last name										

____
Last name first

"Following Directions," page 1: Solution, page 191.

Copyright © 1978 Goodyear Publishing Company

"Following Directions," page 2; Solution, page 191.

RIDDLE PUZZLE

Name ______________________________

Directions:

1. Count 5 rows down. Write the four-letter word starting in the 4th square.
2. Count 5 columns across. Reading down, write the word starting in the 5th square from the top.
3. Find the 10th column across. Write the word starting in the last 4 squares of this column.
4. Write the word made with every other letter in the second row down.
5. Count down to the 5th, 6th, and 7th rows. Write the word made from the 1st letter in each row.
6. Count across to the 9th column. Write the five-letter word that begins with the 1st letter in this column.

Do you know the answer to the riddle? If not, follow these directions.

1. Write the 1st letter in the 2nd row from the bottom.
2. Write the seven-letter word that is in the 4th row down, beginning in the 3rd square.
3. Find the 7th column across. Write the word that begins with the 5th letter in this column.

T	H	I	N	T	S	Q	U	F	E	L
W	O	H	O	E	H	E	T	L	M	S
O	P	E	N	R	G	B	D	I	X	E
Z	E	G	A	R	B	A	G	E	T	R
A	C	O	W	H	A	T	E	S	O	I
N	E	B	S	A	R	R	T	U	V	P
D	L	E	K	S	O	U	P	M	F	E
E	T	R	I	P	L	C	L	A	O	K
A	S	Q	W	A	L	K	O	R	U	N
L	A	W	G	M	A	N	T	K	R	O

Write the words you find here: ______________________________

____

____

For fun:
There are at least 21 words hidden in the rows and 21 words hidden in the columns, besides the words you just wrote. Can you find them?

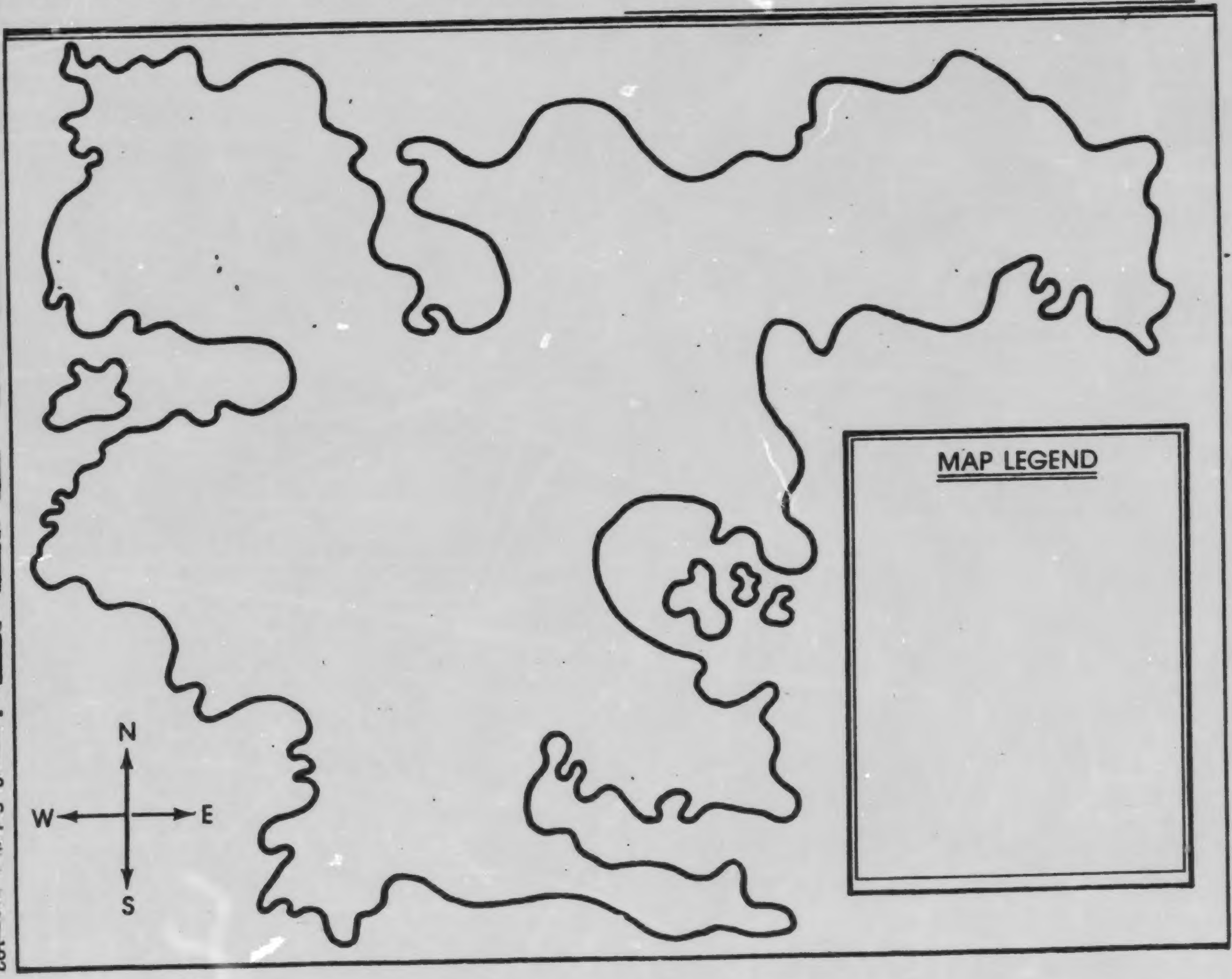
Copyright © 1978 Goodyear Publishing Company

414

MAP FILL-IN

Name ____________________________

1. Read all the directions below before starting to fill in the map.
2. Use color and symbols to show:
    - a river running from north to south
    - two roads crossing the river
    - two bridges for the roads
    - a large swamp area between the two roads, east of the river
    - an airport in the southeast
    - a town on the western bank of the river, south of the southernmost road
    - a church northwest of the northernmost road
    - a mountain range west of the river
    - a school west of the town
    - two streams running from the mountain range into the river
3. Complete the legend to show what the colors and symbols on your map stand for.



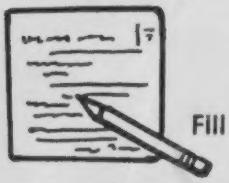
"F ng D ns," 2: S , pa 102.

Copyright © 1978 Goodyear Publishing Company

"Following Directions," page 6. Solution, page 192.

Name ______________________

FOLLOWING DIRECTIONS BY MYSELF

Choose a book or other resource that gives directions for completing these tasks	List the source of the directions you followed	Date completed	Verbs used in the directions
Do a science experiment.			
Cook something from a recipe.			
Do an arts and crafts project.			
Go someplace using someone else's directions.			
Demonstrate a first-aid procedure.			
 Fill out a form.			

Copyright © 1978 Goodyear Publishing Company

Name ____________________

PASTE-ONS
GLUE

Paste on a gum wrapper. Put a ring around the name of the gum.

Paste on a wrapper from your favorite candy bar. Circle the longest word on the wrapper.

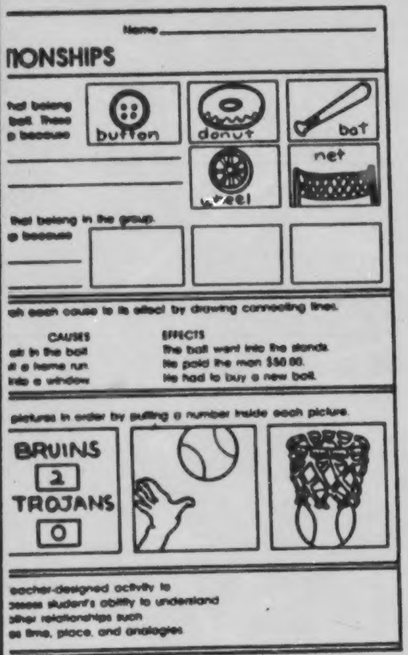
Paste on a label from something you have worn. Put an X on the capital letters.

Paste on a box top from your favorite cereal. Underline the shortest word.

Paste on an ad for a toy you would like to have. Cross out the letters that are found in your first name.

Copyright © 1978 Goodyear Publishing Company

IENT WORKSHEET


Name____________________

TIONSHIPS

hat belong
ball. These
p because

____

____

that belong in the group.
p because

____

____

ch each cause to its effect by drawing connecting lines.

CAUSES	EFFECTS
ak in the ball	The ball went into the stands.
it a home run	He paid the man $50.00.
into a window	He had to buy a new ball.

pictures in order by putting a number inside each picture.

eacher-designed activity to
ssess student's ability to understand
other relationships such
as time, place, and analogies.

page 181.
201.

SKILLS IN THIS SECTION INCLUDE:

- categorizing, classifying, and sequencing information
- recognizing cause-and-effect relationships

Seeing Relationships

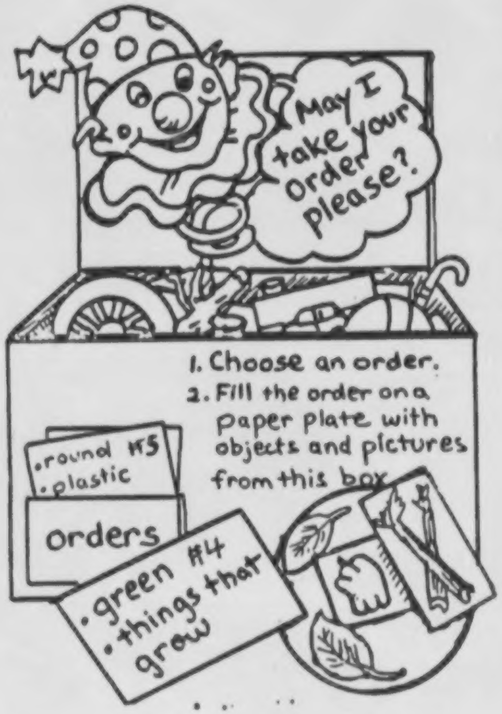
GENERAL ACTIVITIES

JACK IN THE BOX

skills: categorizing
classifying

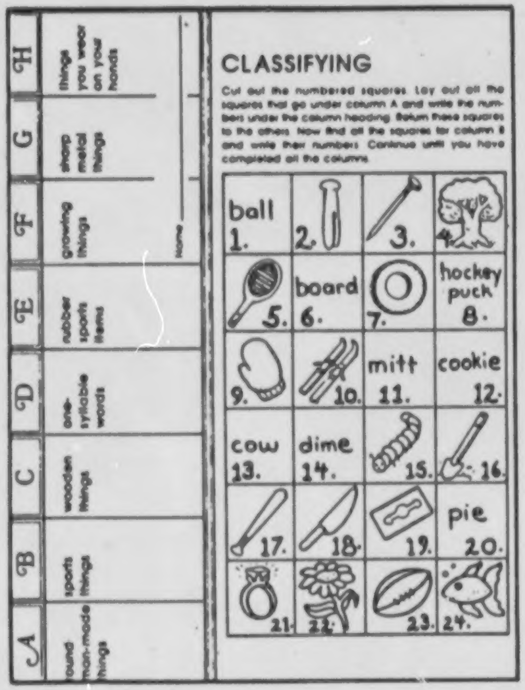
Fill a box with objects and pictures and prepare order forms listing various categories. Children can check their work by showing the order and objects to the teacher or by recording the order number and the objects used to fill it on a simple recording sheet.

Variation:
Children place objects on a paper plate and another child writes an order to fit the objects.


May I take your order please?
1. Choose an order.
2. Fill the order on a paper plate with objects and pictures from this box.
• round #5
• plastic
orders
• green #4
• things that grow

CLASSIFYING WORKSHEET

skill: classifying



A round man-made things

B sports things

C wooden things

D one-syllable words

E rubber sports items

F growing things

G sharp metal things

H things you wear on your hands

Name ______

CLASSIFYING

Cut out the numbered squares. Lay out all the squares that go under column A and write the numbers under the column heading. Return these squares to the others. Now find all the squares for column B and write their numbers. Continue until you have completed all the columns.

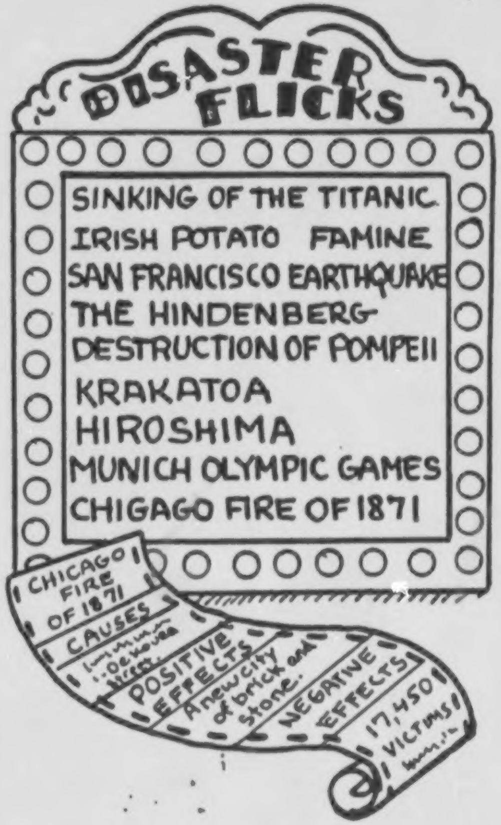
ball 1.
2.
3.
4.
5.
board 6.
7.
hockey puck 8.
9.
10.
mitt 11.
cookie 12.
cow 13.
dime 14.
15.
16.
17.
18.
19.
pie 20.
21.
22.
23.
24.

Reproducible, page 182.
Solution, page 202.

DISASTER FLICKS

skills: identifying causes and effects of historical events

List historical disasters on a chart made to resemble a movie marquee. A child chooses one of the events and does research on it, looking for causes and effects. Then the student writes and/or illustrates its causes and negative and positive effects on a roll of paper.

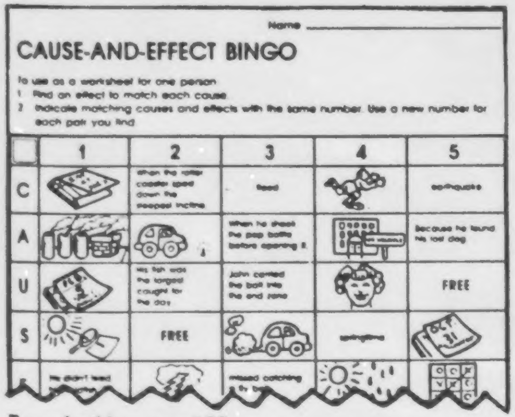

DISASTER FLICKS
SINKING OF THE TITANIC
IRISH POTATO FAMINE
SAN FRANCISCO EARTHQUAKE
THE HINDENBERG
DESTRUCTION OF POMPEII
KRAKATOA
HIROSHIMA
MUNICH OLYMPIC GAMES
CHIGAGO FIRE OF 1871
CHICAGO FIRE OF 1871
CAUSES
POSITIVE EFFECTS
A new city of brick and stone.
NEGATIVE EFFECTS
17,450 VICTIMS

GENERAL ACTIVITIES

CAUSE-AND-EFFECT BINGO WORKSHEET

skill: matching causes and effects

If a worksheet is used as a group Bingo game, label one die with C, A, U, S, E and FREE, and one with 1, 2, 3, 4, 5 and FREE.



Name ____________

CAUSE-AND-EFFECT BINGO

To use as a worksheet for one person
1 Find an effect to match each cause.
2 Indicate matching causes and effects with the same number. Use a new number for each pair you find.

	1	2	3	4	5
C		When the roller coaster sped down the steepest incline	flood		earthquake
A			When he shook the pop bottle before opening it		Because he found his lost dog
U		His fish was the largest caught for the day	John carried the ball into the end zone		FREE
S		FREE		springtime	
	He didn't read		missed catching		

Reproducible, page 183.
Solution, page 202.

(2 to 6 players)

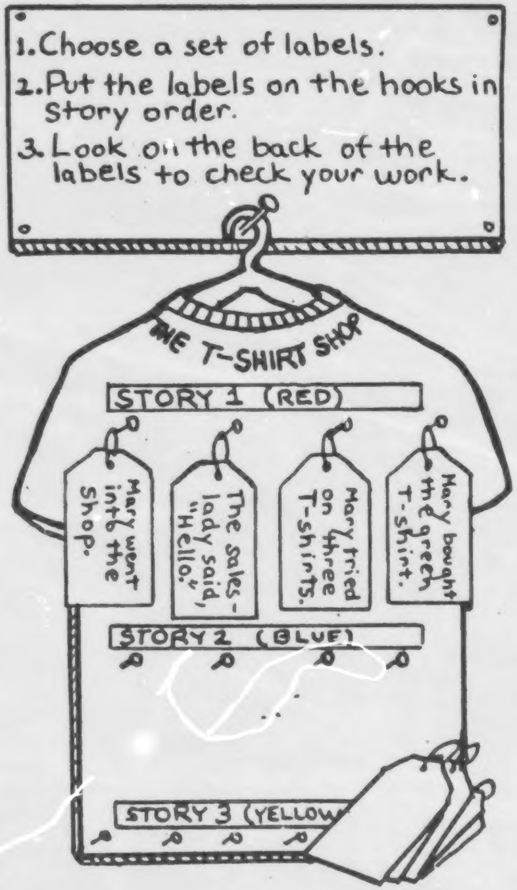
To use as a Bingo game:

1. The players use a special pair of dice, and each gets a worksheet.
2. Each player in turn:
   a. Rolls the dice and locates the box on the top half of the worksheet indicated on the dice.
   b. Finds the effect on the bottom half of the worksheet that matches the cause.
   c. X's out both the cause and the effect boxes, if the group agrees with the choices.
3. The first player to complete a row across, up and down, or diagonally in either half of the worksheet is the winner.

THE T-SHIRT SHOP

skill: arranging sentences in story sequence

Make up simple stories that are three to five sentences in length. Write each sentence on a label, and color-code the labels to show which sentences go together.



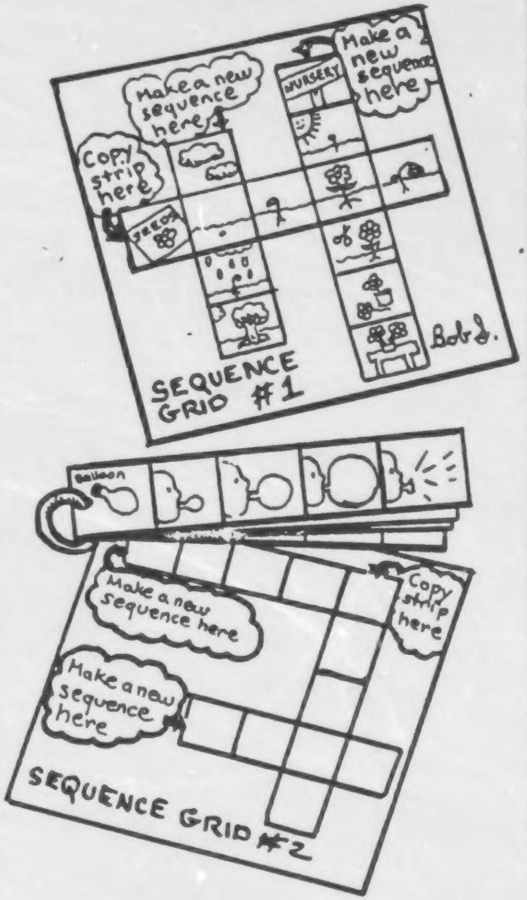
1. Choose a set of labels.
2. Put the labels on the hooks in story order.
3. Look on the back of the labels to check your work.

THE T-SHIRT SHOP
STORY 1 (RED)
Mary went into the shop.
The sales-lady said, "Hello."
Mary tried on three T-shirts.
Mary bought the green T-shirt.
STORY 2 (BLUE)
STORY 3 (YELLOW

SEQUENCE GRIDS

skill: creating new sequences

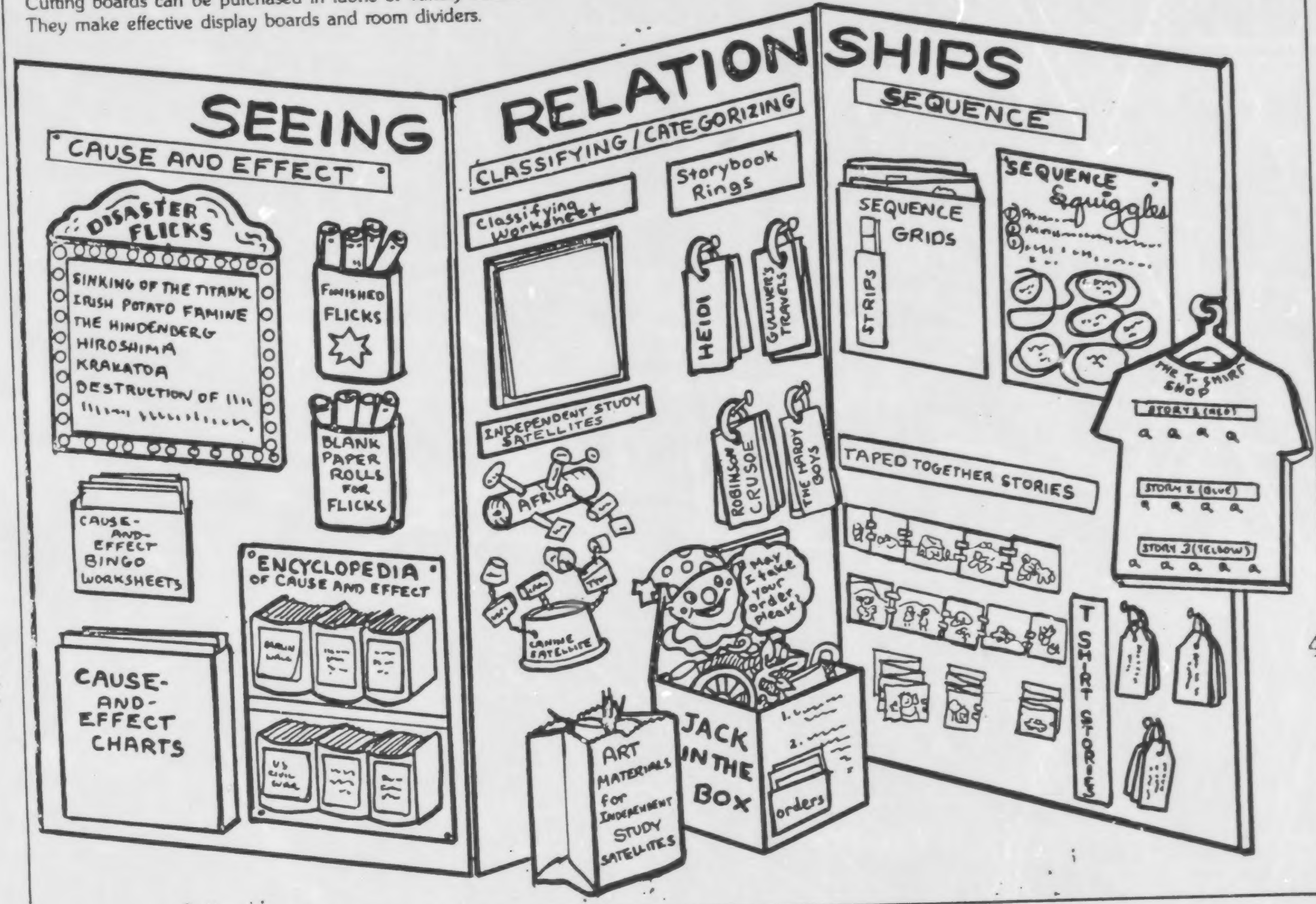
Prepare a set of picture or word-sequence strips and several large cross-grid patterns. Children choose a sequence strip and copy it onto a cross grid. Then they write or draw in new sequences to fit the grid outline.



Make a new sequence here
Make a new sequence here
NURSERY
Copy strip here
SEEDS
Bob J.
SEQUENCE GRID #1
Balloon
Make a new sequence here
Copy strip here
Make a new sequence here
SEQUENCE GRID #2

LEARNING CENTER

Cutting boards can be purchased in fabric or variety stores.
They make effective display boards and room dividers.

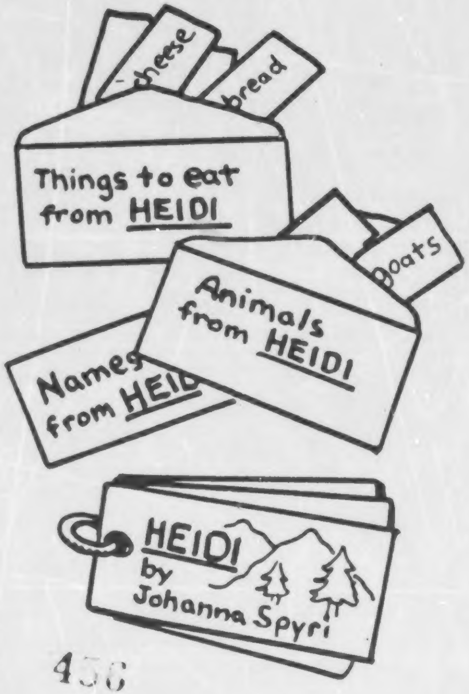

SEEING RELATIONSHIPS
CAUSE AND EFFECT
DISASTER FLICKS
SINKING OF THE TITANK
IRISH POTATO FAMINE
THE HINDENBERG
HIROSHIMA
KRAKATOA
DESTRUCTION OF
FINISHED FLICKS
BLANK PAPER ROLLS FOR FLICKS
CAUSE-AND-EFFECT BINGO WORKSHEETS
ENCYCLOPEDIA OF CAUSE AND EFFECT
US CIVIL WAR
CAUSE-AND-EFFECT CHARTS
CLASSIFYING/CATEGORIZING
Classifying Worksheet
Storybook Rings
HEIDI
GULLIVER'S TRAVELS
ROBINSON CRUSOE
THE HARDY BOYS
INDEPENDENT STUDY SATELLITES
AFRICA
CANINE SATELLITE
May I take your order please?
ART MATERIALS for INDEPENDENT STUDY SATELLITES
JACK IN THE BOX
1.
2.
orders
SEQUENCE
SEQUENCE GRIDS
STRIPS
SEQUENCE Squiggles
THE T-SHIRT SHOP
STORY 1 (RED)
STORY 2 (BLUE)
STORY 3 (YELLOW)
TAPED TOGETHER STORIES
T SHIRT STORIES

GROUP WORK

STORYBOOK RINGS

skill: categorizing

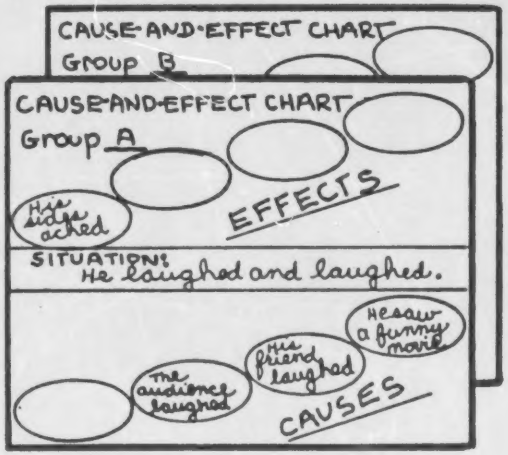
Children name things from a story the group has read or is reading, and write them on wordcards. Help the children categorize the cards. Make an envelope for each category and file the corresponding wordcards within. Attach all the envelopes from one story to a chart ring that names the story or book.


cheese
bread
Things to eat from HEIDI
goats
Animals from HEIDI
Names from HEID
HEIDI by Johanna Spyri

CAUSE-AND-EFFECT CHARTS

skill: developing causes and effects for a given situation

Make two cause/effect charts and laminate them so that they may be used many times. Divide the group in half, and give each half a chart on which the same situation has been written. Each group fills in causes and effects on its chart. The group that lists the greatest number of reasonable causes and effects may suggest the next situation to be used.


CAUSE-AND-EFFECT CHART
Group B
CAUSE-AND-EFFECT CHART
Group A
His sides ached
EFFECTS
SITUATION: He laughed and laughed.
He saw a funny movie
His friend laughed
The audience laughed
CAUSES

TAPED-TOGETHER STORIES

skills: recalling important story events
recalling story sequence

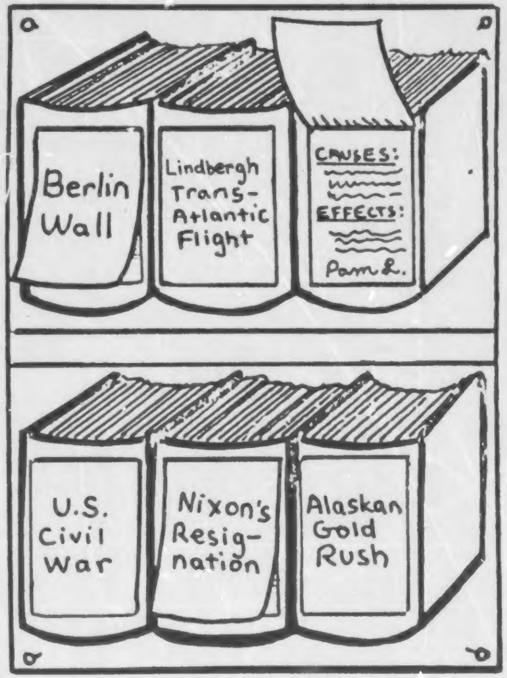
Each child chooses an event to illustrate from a story the group has read. When the children finish their illustrations, they arrange the pictures in story sequence, tape them together, and display the story strip in the classroom.

INDEPENDENT STUDY

ENCYCLOPEDIA OF CAUSE AND EFFECT

skill: researching historical events for causes and effects

Make a chart to resemble books on a shelf. Tape or staple several sheets of paper to the "spine" of each book and label the top sheet with a historical event. Each child chooses an event to research and writes its causes and effects on the extra sheets.

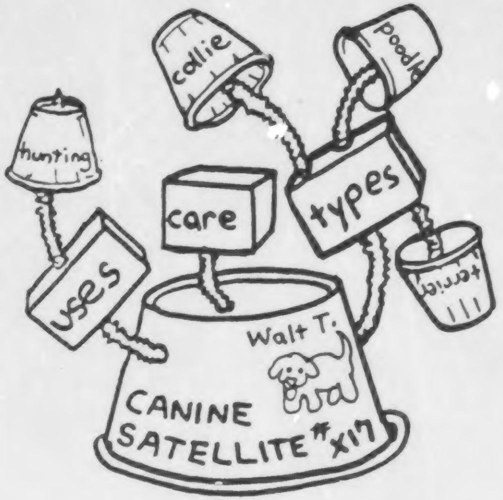

Berlin Wall
Lindbergh Trans-Atlantic Flight
CAUSES:
EFFECTS:
Pam L.
U.S. Civil War
Nixon's Resignation
Alaskan Gold Rush

INDEPENDENT STUDY

INDEPENDENT STUDY SATELLITES

skills: *categorizing subtopics within a main topic*
researching

Children use cottage cheese cartons, boxes, or other containers as bases for their satellites, labeling them with their independent study topics. The children think of information categories related to their topics and label the first "arms" of their satellites with these categories. They add information to the major categories in their topic as their study progresses.

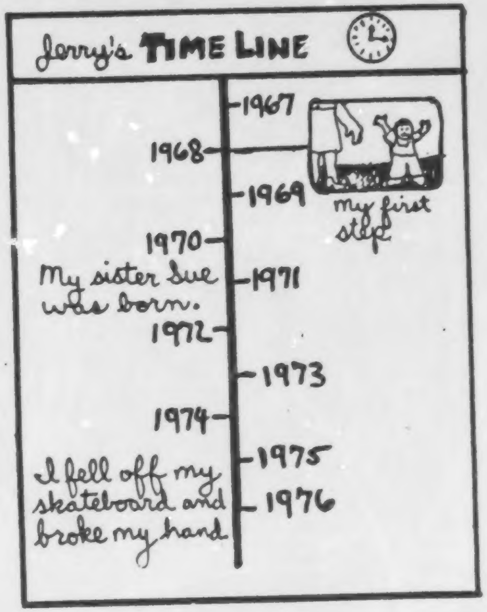

hunting
collie
poodle
care
types
uses
terrier
Walt T.
CANINE SATELLITE #X17

INTEGRATING WITH THE REAL WORLD

PERSONAL TIME LINES

skills: *seeing time relationships*
making time lines

Children make up their own personal times lines, from birth to the present. Major events in their lives are written, drawn, or illustrated with photographs from home in time sequence.


Jerry's TIME LINE
1967
1968
1969
my first step
1970
1971
My sister Sue was born.
1972
1973
1974
1975
I fell off my skateboard and broke my hand
1976

HOMEWORK CATEGORIZING

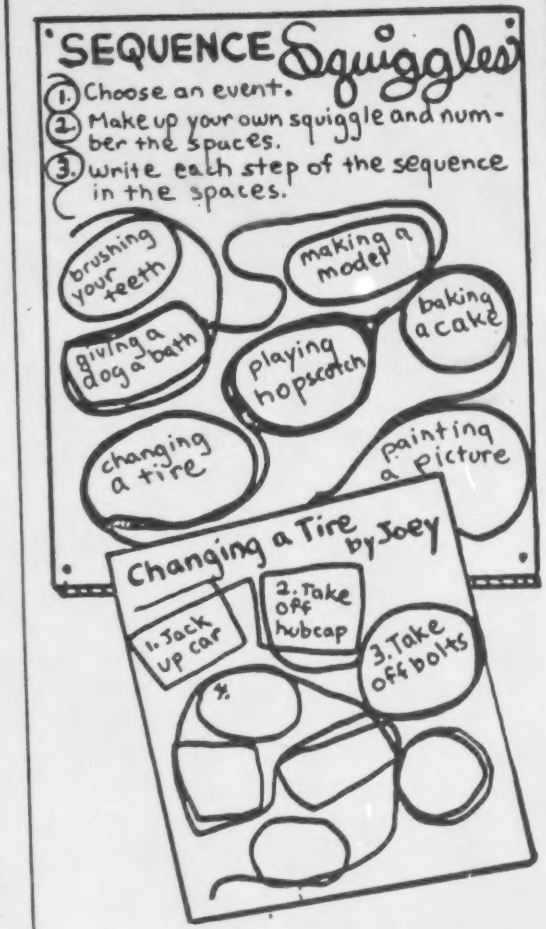
skill: *categorizing*

Children clean out a drawer, shelf, or cupboard at home and sort the items into several categories. Afterward, they make lists of the categories and items and bring them to school.

SEQUENCE SQUIGGLES

skill: *sequencing steps in real-life procedures*

Make a squiggle chart listing a variety of everyday events. Younger children might start with simple squiggles of only three or four spaces; older children may draw more complex designs.



SEQUENCE Squiggles

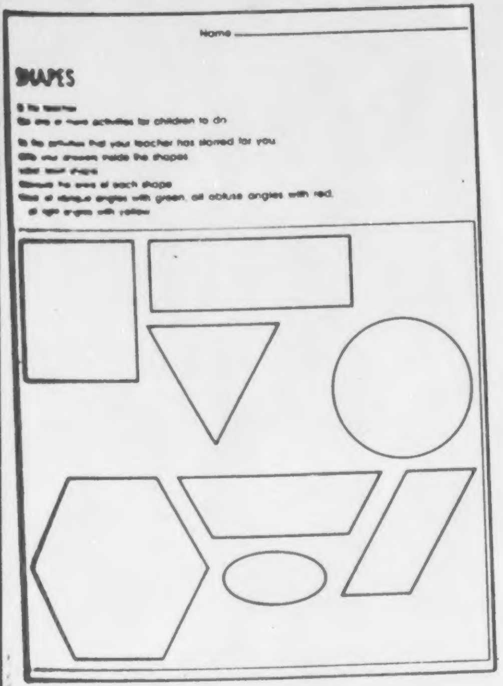
① Choose an event.

② Make up your own squiggle and number the spaces.

③ Write each step of the sequence in the spaces.

brushing your teeth
making a model
baking a cake
giving a dog a bath
playing hopscotch
changing a tire
painting a picture
Changing a Tire by Joey
1. Jack up car
2. Take off hubcap
3. Take off bolts
4.

ASSESSMENT WORKSHEET


Name

SHAPES

Reproducible, page 146.
Solution, page 194.

SKILLS IN THIS SECTION INCLUDE:

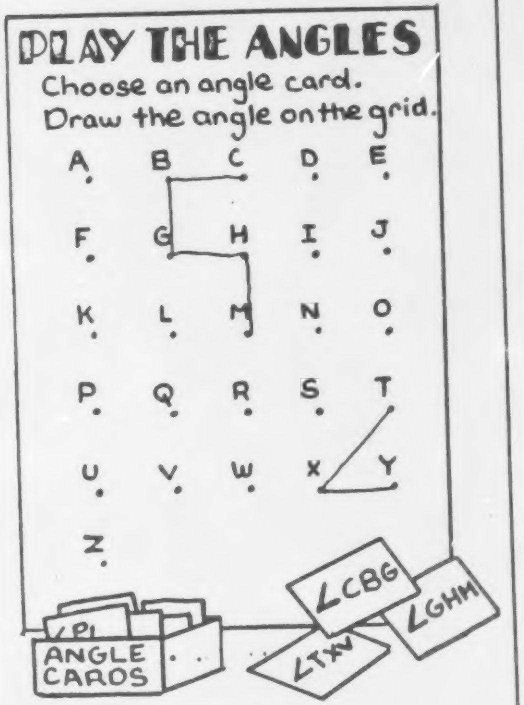
- identifying, constructing, measuring, and using geometric shapes
- developing vocabulary related to geometry
- applying geometry skills and knowledge in different contexts

GENERAL ACTIVITIES

PLAY THE ANGLES

skills: *naming angles*
computing area
measuring line segments

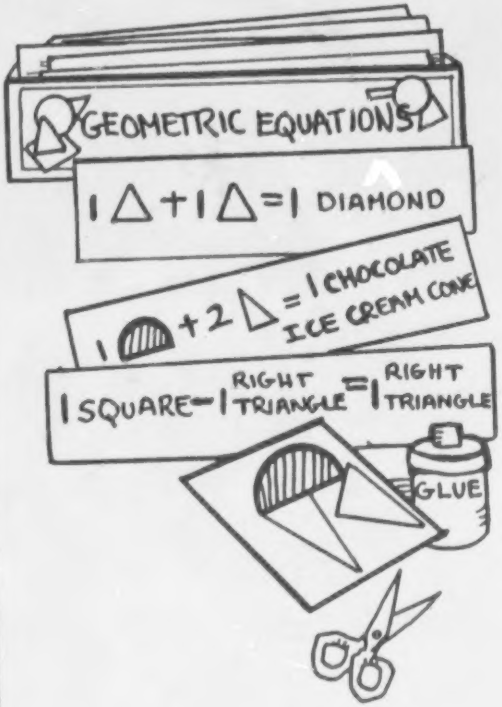
Make up a Play the Angles worksheet and set of cards. Duplicate the worksheet and distribute to each player. Children take turns selecting cards and drawing angles on their worksheets. There may be several kinds of winners: the player who has the most enclosed shapes, the greatest amount of total area within all enclosed shapes, or the longest total length of line segments.


PLAY THE ANGLES
Choose an angle card.
Draw the angle on the grid.
A B C D E
F G H I J
K L M N O
P Q R S T
U V W X Y
Z
∠P
ANGLE CARDS
∠CBG
∠GHM
∠TXY

GEOMETRIC EQUATIONS

skills: *identifying and constructing shapes*

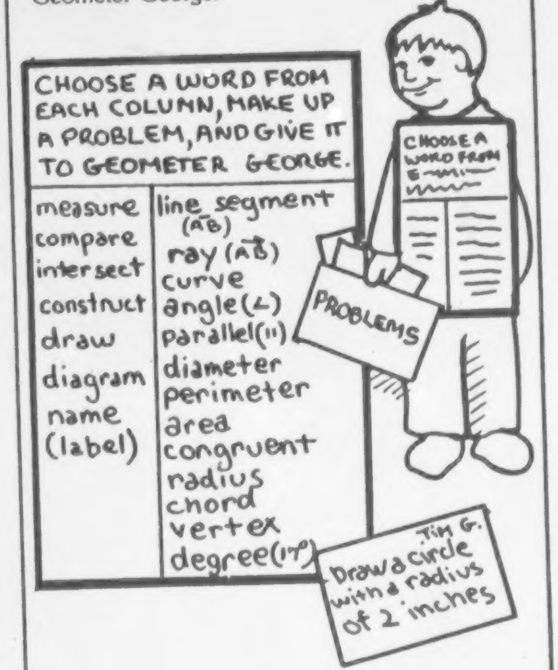
Children choose a card and translate the equation by drawing or cutting and pasting to show what steps they went through.


GEOMETRIC EQUATIONS
1△+1△=1 DIAMOND
1 +2△ = 1 CHOCOLATE ICE CREAM CONE
1 SQUARE − 1 RIGHT TRIANGLE = 1 RIGHT TRIANGLE
GLUE

GEOMETER GEORGE

skills: *vocabulary development*
using vocabulary in context

Select from textbooks the geometric vocabulary appropriate for your class. List the verbs and process words used in geometry in one column of a large chart and the words naming geometric forms, shapes, or objects in the second column. Children choose problems to solve from Geometer George.



CHOOSE A WORD FROM EACH COLUMN, MAKE UP A PROBLEM, AND GIVE IT TO GEOMETER GEORGE.

measure
compare
intersect
construct
draw
diagram
name
(label)

line segment ($\overline{AB}$)
ray ($\overrightarrow{AB}$)
curve
angle (∠)
parallel (∥)
diameter
perimeter
area
congruent
radius
chord
vertex
degree (1°)

Tim G.
Draw a circle with a radius of 2 inches

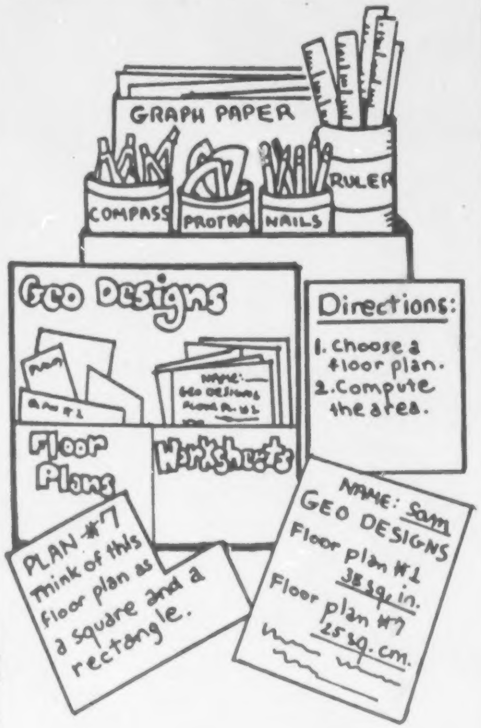
CHOOSE A WORD FROM
PROBLEMS

GENERAL ACTIVITIES

GEO DESIGNS

skills: *computing areas*
adding and subtracting areas

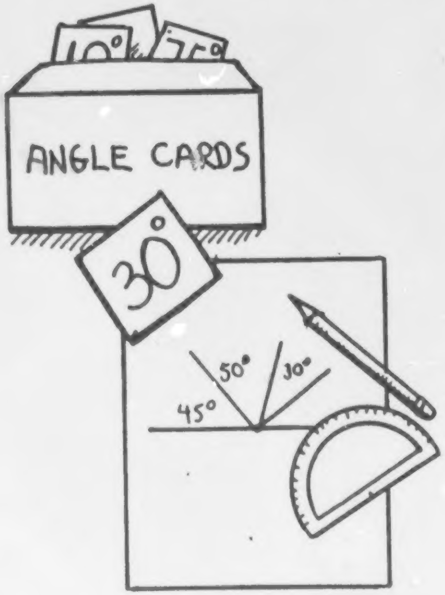
Make shapes of differing dimensions and label as floor plans. Also make up a simple recording sheet with additional questions, such as: What is the total area of all the floor plans you measured? What is the difference in size between the largest and smallest floor plans?


GRAPH PAPER
COMPASS
PROTRA
NAILS
RULER
Geo Designs
Directions:
1. Choose a floor plan.
2. Compute the area.
Floor Plans
Worksheets
PLAN #7
Think of this floor plan as a square and a rectangle.
NAME: Sam
GEO DESIGNS
Floor plan #1
38 sq. in.
Floor plan #7
25 sq. cm.

360° GAME

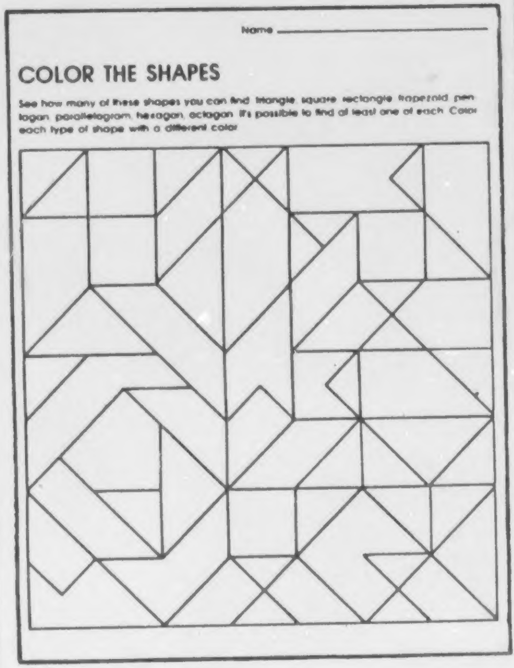
skill: *Using a protractor to measure and draw angles*

Each player begins with a straight line that has a point in the middle. Players take turns choosing angle cards and using a protractor to construct and label angles on their line. Each angle must be tangent to the preceding one. The first player to draw 360° around the line is the winner.


10°
75°
ANGLE CARDS
30°
45°
50°
30°

COLOR THE SHAPES WORKSHEET

skill: *identifying geometric shapes*



Name ____________________

COLOR THE SHAPES

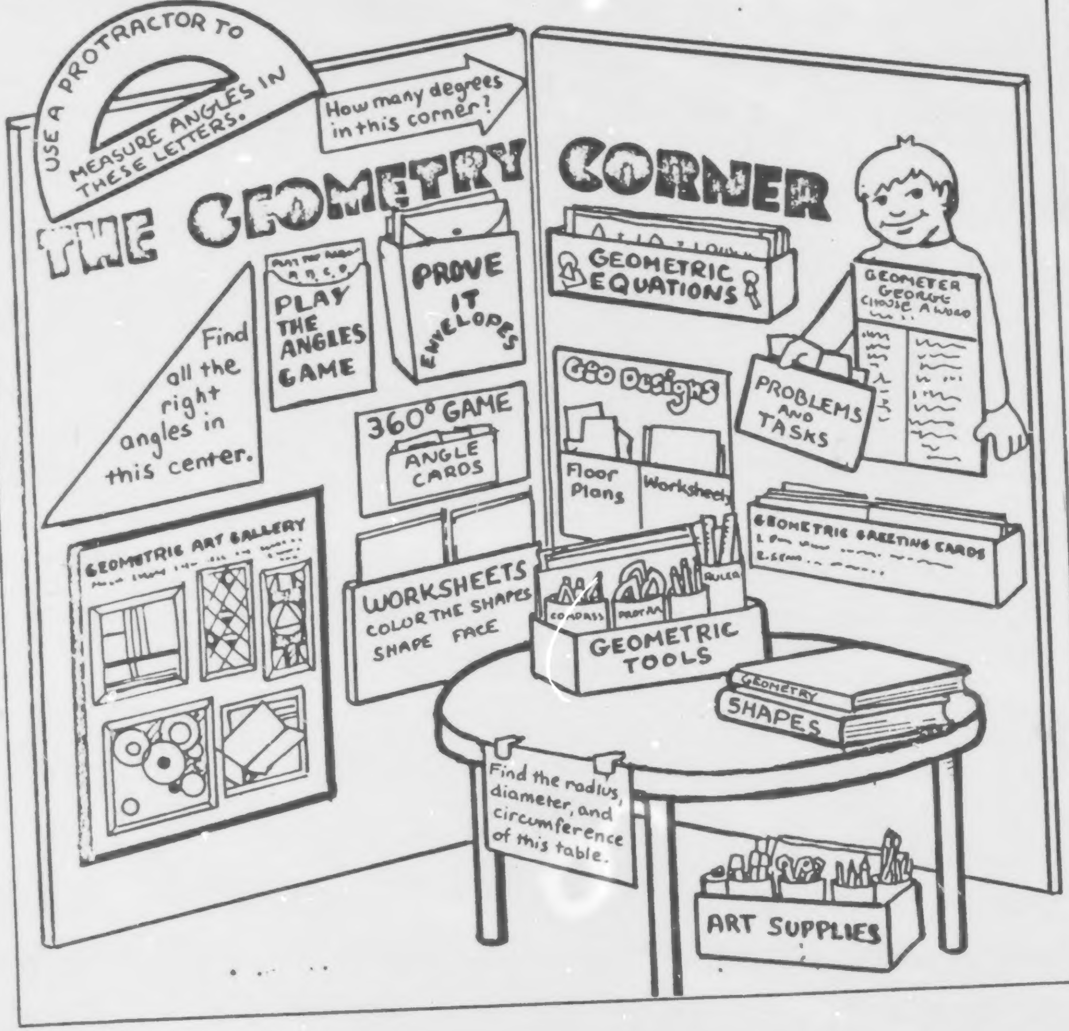
See how many of these shapes you can find: triangle, square, rectangle, trapezoid, pentagon, parallelogram, hexagon, octagon. It's possible to find at least one of each. Color each type of shape with a different color.

Reproducible, page 147.
Solution, page 194.

DO NOT REMOVE FROM BOOK

LEARNING CENTER

A folding screen can be used to partition off a center from the rest of the room and provide a space in which children can work. Direction cards posted at the center direct the students to make use of its equipment and furniture in skill tasks.

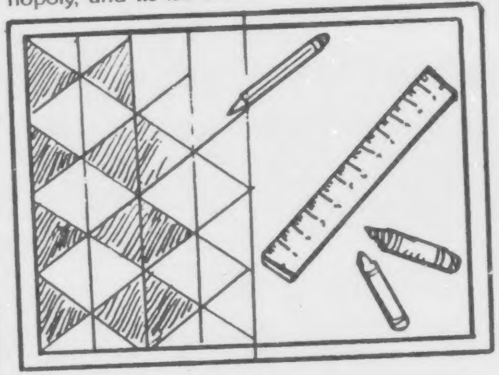

USE A PROTRACTOR TO MEASURE ANGLES IN THESE LETTERS.
How many degrees in this corner?
THE GEOMETRY CORNER
GEOMETRIC EQUATIONS
GEOMETER GEORGE CHOOSE A WORD
Find all the right angles in this center.
PLAY THE ANGLES GAME
PROVE IT ENVELOPES
360° GAME
ANGLE CARDS
Geo Designs
Floor Plans
Worksheets
PROBLEMS AND TASKS
GEOMETRIC GREETING CARDS
GEOMETRIC ART GALLERY
WORKSHEETS COLOR THE SHAPES SHAPE FACE
COMPASS
PROTRA
RULER
GEOMETRIC TOOLS
GEOMETRY
SHAPES
Find the radius, diameter, and circumference of this table.
ART SUPPLIES

GROUP WORK

GAMEBOARD DESIGNS

skills: developing geometric products
problem solving

Discuss the layout and count the squares on a checkerboard. Provide materials for children to use in designing and making new checkerboards, incorporating geometric shapes other than squares. As students use the new boards to play checkers, discuss the rules and rewrite them to adapt the game to the new board designs. This process can be repeated for other familiar gameboards such as Parcheesi, Monopoly, and tic-tac-toe.



WORD-CARD GAMES

skill: understanding and identifying geometric terms and forms

With the group's help, list words naming geometric processes and figures, and have children make cards of these words. Write directions for several simple games such as Go Fish, Lotto, and Concentration. Children use the word cards to play the games. Games may be stored for later independent use.

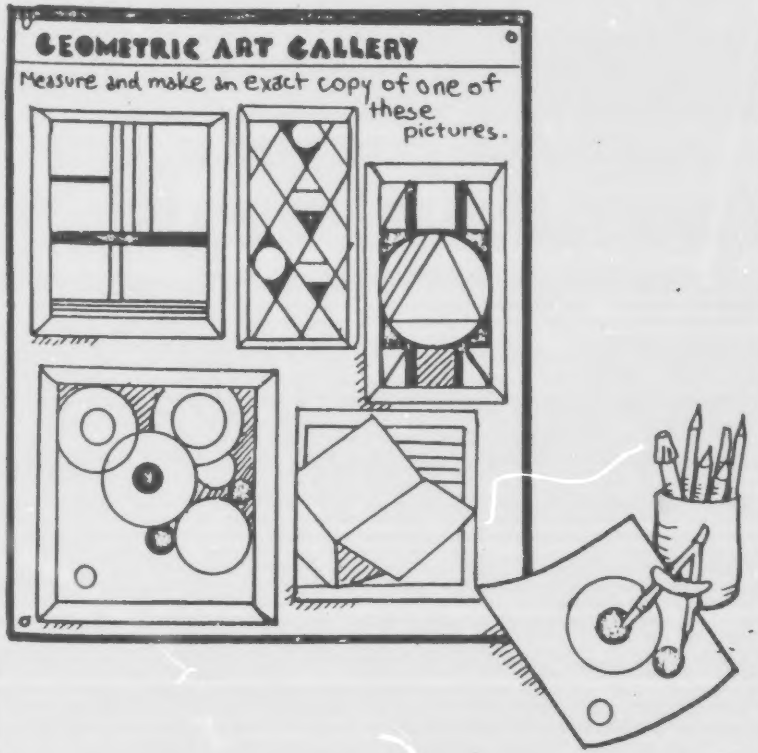
INDEPENDENT STUDY

GEOMETRIC ART GALLERY

skills: *reproducing geometric shapes*
problem solving

Children reproduce a picture from the gallery by identifying, measuring, and drawing shapes and then coloring their reproductions.

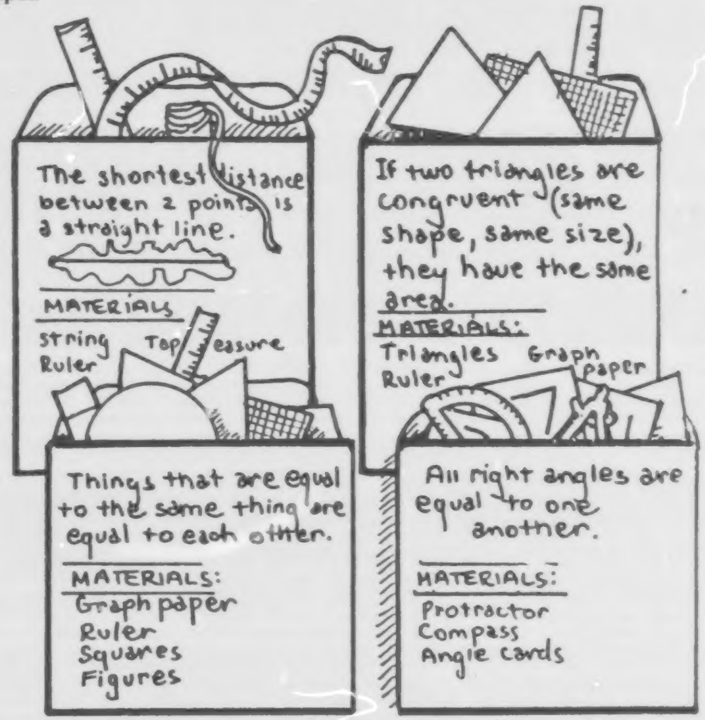
Variations:
Children can use the same shapes and dimensions found in the picture but rearrange them into a different pattern. Or they can use the same shapes and patterns but alter the dimensions of the shapes.


GEOMETRIC ART GALLERY
Measure and make an exact copy of one of these pictures.

PROVE IT ENVELOPES

skills: *demonstrating proofs for geometric statements*
problem solving

Fill each PROVE IT envelope with objects needed to illustrate a proof. Children choose envelopes, prove the statements or formulas, and record the process and outcomes on a teacher-made worksheet or blank sheet of paper.


The shortest distance between 2 points is a straight line.
MATERIALS
string
Ruler
Tape measure
If two triangles are congruent (same shape, same size), they have the same area.
MATERIALS:
Triangles
Ruler
Graph paper
Things that are equal to the same thing are equal to each other.
MATERIALS:
Graph paper
Ruler
Squares
Figures
All right angles are equal to one another.
MATERIALS:
Protractor
Compass
Angle cards

INDEPENDENT STUDY

RESEARCHING GEOMETERS

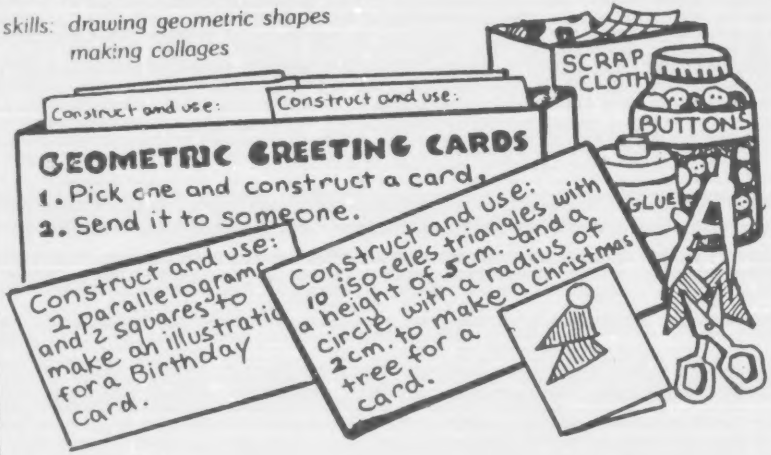
skills: *research*
writing true/false statements

List the names of famous geometers such as Euclid, Pythagoras, Anaxagoras, and Plato. Children choose one to research and write a series of true/false statements about the geometer to try out on their friends.

INTEGRATING WITH THE REAL WORLD

GEOMETRIC GREETING CARDS

skills: *drawing geometric shapes*
making collages


Construct and use:
Construct and use:
SCRAP CLOTH
BUTTONS
GLUE
GEOMETRIC GREETING CARDS
1. Pick one and construct a card.
2. Send it to someone.
Construct and use: 2 parallelograms and 2 squares to make an illustration for a Birthday card.
Construct and use: 10 isoceles triangles with a height of 5cm. and a circle with a radius of 2cm. to make a Christmas tree for a card.

GEOMETRIC EXHIBITS

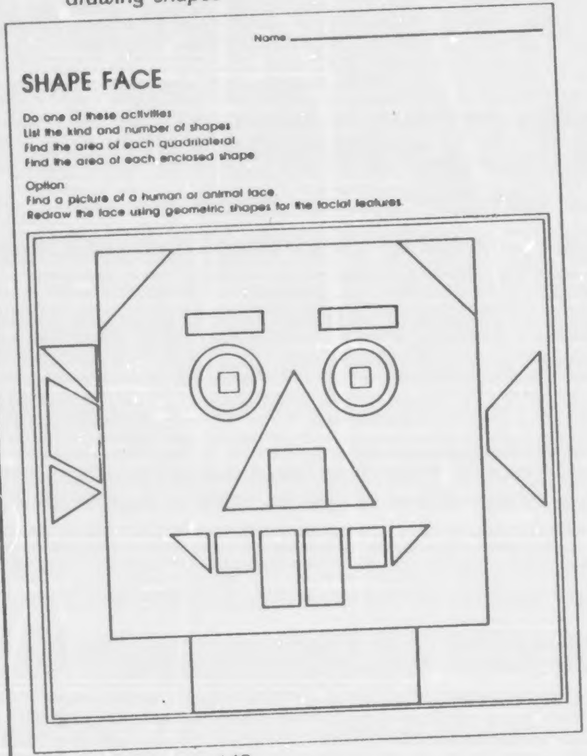
skill: *seeing shapes in everyday objects*

Children set up geometric exhibits based on themes such as foods, toys, and fantasy. Objects on display are to be labeled by the children to show the shapes found in them.

INTEGRATING WITH THE REAL WORLD

SHAPE FACE WORKSHEET

skills: *naming shapes*
finding areas of shapes
drawing shapes



Name ____________

SHAPE FACE

Do one of these activities
List the kind and number of shapes
Find the area of each quadrilateral
Find the area of each enclosed shape

Option
Find a picture of a human or animal face.
Redraw the face using geometric shapes for the facial features.

Reproducible, page 148.
Solution, page 194.

GEOMETRY IN ART

skill: *researching geometric art*

Children research and describe pictures that contain geometric shapes, and report on artists who use geometric shapes as the basis of their style.

SIZABLE SUMS

Name ____________________

Write the sums in number words

Show your work here in numerals

1. ten thousand four hundred
plus
eighty-five
equals

2. six hundred fifty-seven
plus
one hundred thirty-two
equals

3. nine hundred twenty-three million two hundred seventy-one thousand sixty-six
plus
ten million five thousand eight hundred ten
equals

4. four hundred billion twelve million three thousand six hundred thirty-two
plus
one billion ten million one thousand two hundred two
equals

5. nine hundred forty billion thirty-six million seven hundred twenty-five thousand four
plus
one million two hundred three thousand nine hundred thirteen
equals

"Reading and Writing Numerals," page 9. Solution, page 192

Copyright © 1978 Goodyear Publishing Company

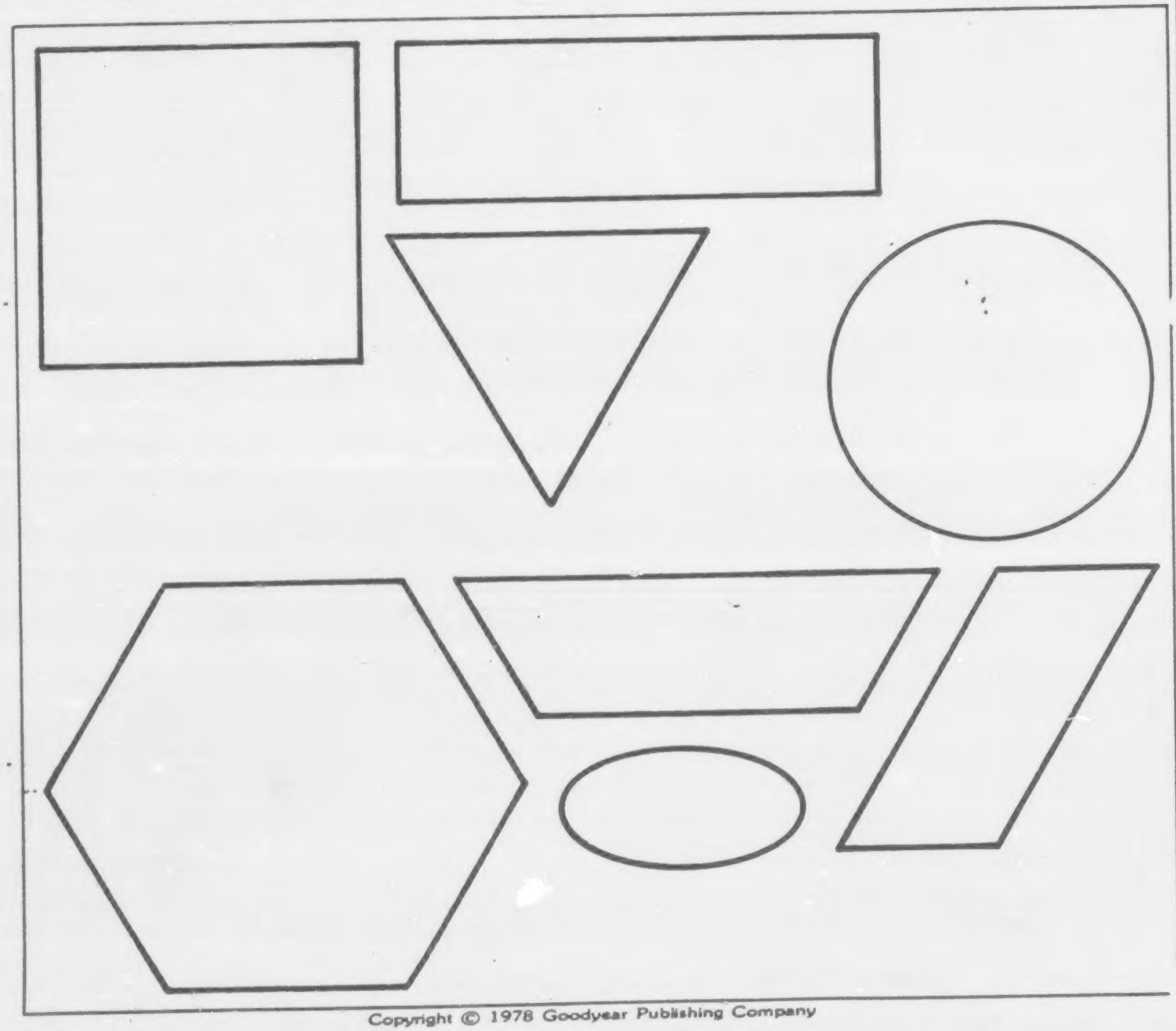
"Geometry," page 19. Solution, page 194.

Name ______________________________

SHAPES

To the teacher:
Star one or more activities for children to do.

Do the activities that your teacher has starred for you.
Write your answers inside the shapes.
Label each shape.
Measure the area of each shape.
Mark all oblique angles with green, all obtuse angles with red,
all right angles with yellow.



Copyright © 1978 Goodyear Publishing Company

"Reading and Writing Numerals," page 9. Solution, page 193.

Name ______________________________

NUMBER POEM

I once met a man on his way to St. Ives,
He had two thousand four hundred ninety-two wives.

One thousand two cats,
Six hundred three hats,
And two hundred thirty-six one-eyed bats.

He carried a pail of two thousand ten frogs,
And was chased by one hundred twenty-three dogs.
His seventeen sons wore eighty-five shirts,
And his daughter wore five hundred forty-eight skirts.

They all did arrive
In the town of St. Ives,
And forever after lived wonderful lives.

Write the numerals to tell how many of the things below are in the poem:

__________ wives
__________ cats
__________ sons
__________ daughters
__________ hats
__________ bats
__________ shirts
__________ frogs
__________ dogs
__________ skirts

List and find the total number of:

PEOPLE

ANIMALS

CLOTHES

Copyright © 1978 Goodyear Publishing Company

BASIC NUMBER FACTS

Use the code to record students' readiness, practice, and mastery of basic facts related to the various math processes.

CODE

⧄ indicates readiness

☒ indicates student is studying or practicing; enter date when mastery is achieved

	SKILLS											
	+			−			×			÷		
STUDENTS' NAMES	BASIC FACTS (through 18)	SOLVING WORD PROBLEMS	APPLYING FACTS TO NEW SITUATIONS	BASIC FACTS (through 18)	SOLVING WORD PROBLEMS	APPLYING FACTS TO NEW SITUATIONS	BASIC FACTS (through 10's)	SOLVING WORD PROBLEMS	APPLYING FACTS TO NEW SITUATIONS	BASIC FACTS (dividends to 100)	SOLVING WORD PROBLEMS	APPLYING FACTS TO NEW SITUATIONS

"Basic Math Facts," page 13.

Name ______________________________

JEOPARDY

To use as a worksheet for one person:

For each topic, write a related word problem and number equation in the boxes. The answers will be the numbers in the boxes.

(4 players)

To use as a game:

1. Three of the players are contestants and the fourth is the moderator.
2. Each contestant selects a topic and writes word problems and equations for each numeral in his or her column. When a contestant completes a column, the moderator verifies the problems.
3. Contestants who correctly use all the numerals in their columns win.

FOOD	ANIMALS	CARS
6	4	2
8	9	10
10	14	16
81	24	36

Copyright © 1978 Goodyear Publishing Company

"Basic Math Facts," page 14. Solution, page 193

THE PYRAMID GAME

Name ______________________

______________________ ①

(Contestant's Name)

7 × 4 =

7 × 5 = 5 × 4 =

9 × 4 = 9 × 5 = 3 × 2 =

4 × 8 = 2 × 5 = 8 × 2 = 3 × 5 =

6 × 2 = 9 × 8 = 7 × 9 = 5 × 6 = 6 × 9 =

3 × 6 = 2 × 4 = 8 × 7 = 6 × 5 = 4 × 6 = 7 × 6 =

To use as a worksheet for one person:
Fill in each pyramid with the correct products.

To use as a game: (3 players)

1. Get a stack of flashcards and a timer.
2. Write each player's name in one of the pyramid squares.
3. Choose a contestant, a tester, and a recorder.
4. Set the timer for two, three, or four minutes.
5. The tester shows flashcards to the contestant. For every correct answer the contestant gives, the recorder marks an X in a box of the contestant's pyramid. (Disregard the facts written on the worksheet.)
6. At the end of the time limit the next player becomes the contestant, and so on.
7. When all three players have had their turn as contestant, the one who has the most boxes in the pyramid filled in is the winner.

______________________ ②

(Contestant's Name)

8 × 9 =

6 × 7 = 3 × 8 =

3 × 3 = 6 × 4 = 7 × 2 =

9 × 7 = 4 × 9 = 7 × 3 = 8 × 6 =

7 × 7 = 9 × 3 = 6 × 6 = 4 × 7 = 2 × 8 =

5 × 8 = 9 × 2 = 0 × 7 = 8 × 8 = 4 × 3 = 5 × 7 =

______________________ ③

(Contestant's Name)

7 × 8 =

9 × 9 = 0 × 8 =

3 × 9 = 8 × 3 = 5 × 5 =

4 × 4 = 2 × 6 = 4 × 5 = 2 × 9 =

5 × 3 = 9 × 6 = 4 × 2 = 5 × 2 = 6 × 8 =

2 × 3 = 6 × 3 = 5 × 9 = 3 × 4 = 3 × 7 = 8 × 4 =

Copyright © 1978 Goodyear Publishing Company

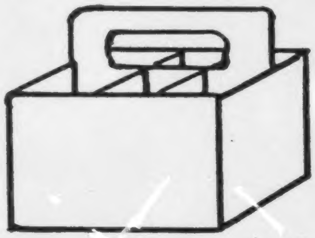
"Basic Math Facts," page 15; Solution, page 193.

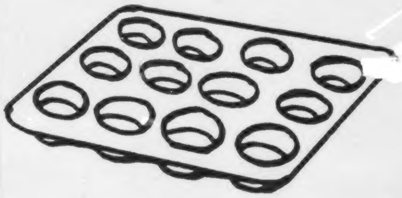
Copyright © 1978 Goodyear Publishing Company

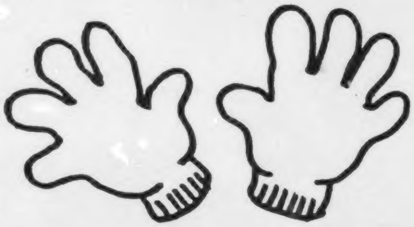
Name

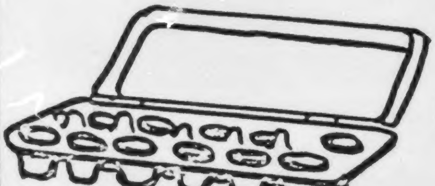
IT'S THE REAL THING

1. Get a real six-pack container, muffin tin, pair of gloves, and egg carton.
2. Write math signs (+, −, ×, ÷) on the drawings below to show the kinds of basic facts you will make.
3. Group real objects (buttons, beans, bottle tops) in the containers to show all the ways you can make that number.
4. Write equations for each number name you discover on the lines beside the drawings.







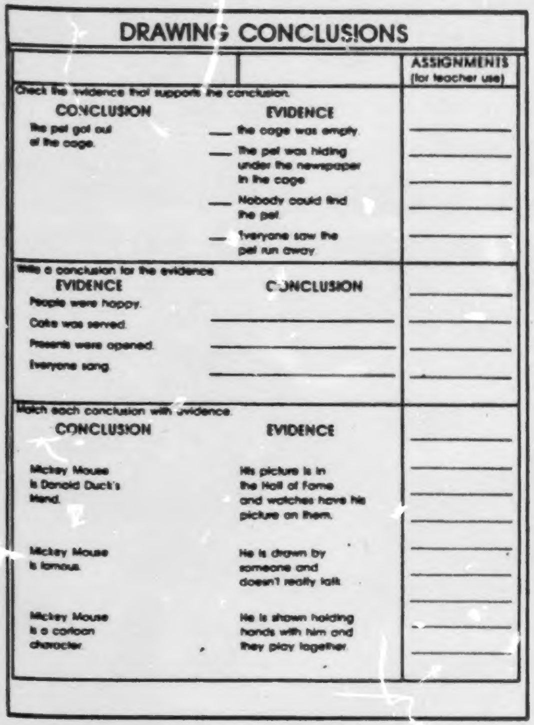


"Basic Math Facts," page 18; Solution, page 194

Worksheet. 145

Copyright © 1978 Goodyear Publishing Company

ASSESSMENT WORKSHEET



DRAWING CONCLUSIONS

ASSIGNMENTS (for teacher use)

Check the evidence that supports the conclusion.

CONCLUSION	EVIDENCE
The pet got out of the cage.	___ The cage was empty. ___ The pet was hiding under the newspaper in the cage. ___ Nobody could find the pet. ___ Everyone saw the pet run away.

Write a conclusion for the evidence.

EVIDENCE	CONCLUSION
People were happy.	
Cake was served.	______________
Presents were opened.	______________
Everyone sang.	______________

Match each conclusion with evidence.

CONCLUSION	EVIDENCE
Mickey Mouse is Donald Duck's friend.	His picture is in the Hall of Fame and watches have his picture on them.
Mickey Mouse is famous.	He is drawn by someone and doesn't really talk.
Mickey Mouse is a cartoon character.	He is shown holding hands with him and they play together.

Reproducible, page 184.
Solution, page 202.

SKILLS IN THIS SECTION INCLUDE:

- identifying and developing evidence to support a conclusion
- developing conclusions related to given evidence

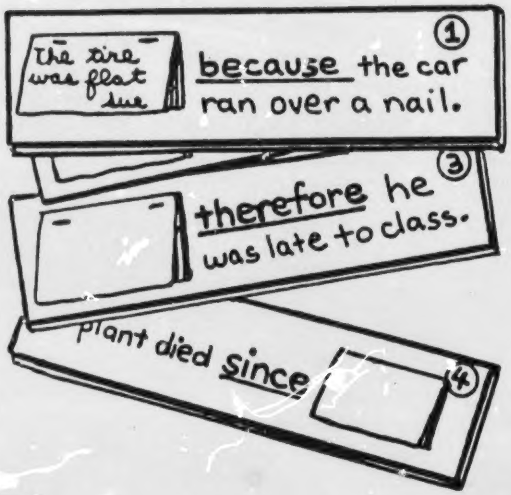
Drawing Conclusions

GENERAL ACTIVITIES

CONCLUSION CONNECTORS

skills: *creating causes and effects*
seeing causes and effects as evidence and conclusions

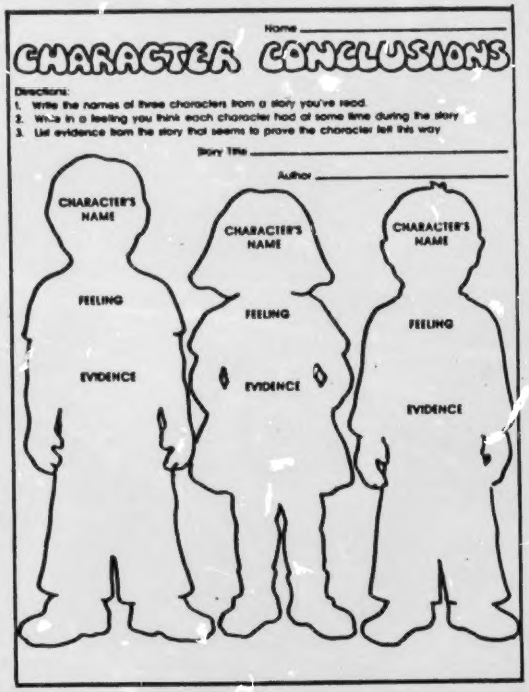
Prepare a set of connector strips and staple blank pads of paper onto the strips where the sentence is incomplete. Children read the strips and add either the evidence or the conclusion that would complete the statements.


①
The tire was flat due
because the car ran over a nail.
③
therefore he was late to class.
plant died since
④

433

CHARACTER CONCLUSIONS WORKSHEET

skill: *locating evidence to support a conclusion*



Name

CHARACTER CONCLUSIONS

Directions:
1. Write the names of three characters from a story you've read.
2. Write in a feeling you think each character had at some time during the story
3. List evidence from the story that seems to prove the character felt this way

Story Title

Author

CHARACTER'S NAME

FEELING

EVIDENCE

CHARACTER'S NAME

FEELING

EVIDENCE

CHARACTER'S NAME

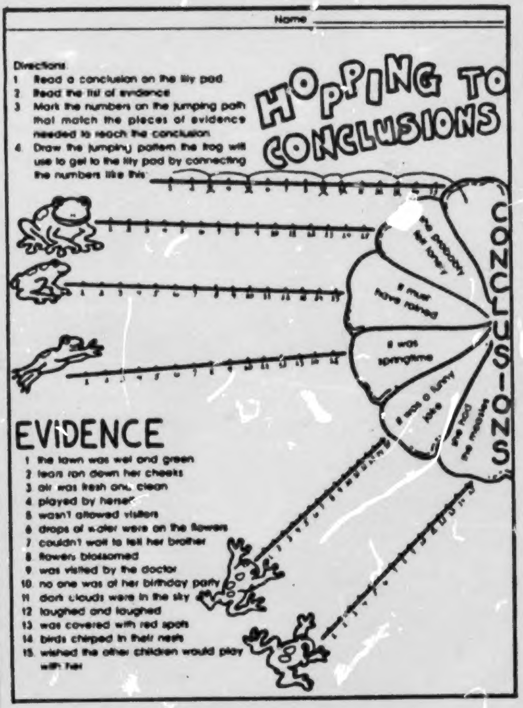
FEELING

EVIDENCE

Reproducible, page 185.
Solution, page 202.

HOPPING TO CONCLUSIONS WORKSHEET

skill: *identifying evidence to support a conclusion*



Name

Directions
1. Read a conclusion on the lily pad
2. Read the list of evidence
3. Mark the numbers on the jumping path that match the pieces of evidence needed to reach the conclusion.
4. Draw the jumping pattern the frog will use to get to the lily pad by connecting the numbers like this

HOPPING TO CONCLUSIONS

CONCLUSIONS

she probably felt lonely

it must have rained

it was springtime

it was a funny joke

she had the measles

EVIDENCE
1. the lawn was wet and green
2. tears ran down her cheeks
3. air was fresh and clean
4. played by herself
5. wasn't allowed visitors
6. drops of water were on the flowers
7. couldn't wait to tell her brother
8. flowers blossomed
9. was visited by the doctor
10. no one was at her birthday party
11. dark clouds were in the sky
12. laughed and laughed
13. was covered with red spots
14. birds chirped in their nests
15. wished the other children would play with her

Reproducible, page 186.
Solution, page 203.

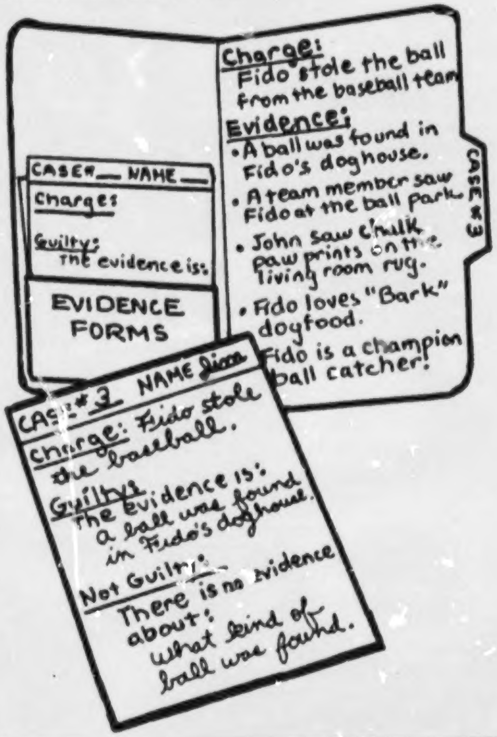
484

GENERAL ACTIVITIES

LEGAL BRIEFS

skills: *selecting evidence to support a conclusion*
developing evidence needed to support a conclusion

Develop a set of legal briefs by writing a charge and a list of related and unrelated evidence on the inside of a manila folder. Children select and read a brief and fill out an evidence form made by the teacher for the case. Some evidence can come from the list inside the brief; other evidence may be reasoned by the child. Additional legal briefs can be created by the children for their classmates to use.



Charge:
Fido stole the ball from the baseball team
Evidence:
- A ball was found in Fido's doghouse.
- A team member saw Fido at the ball park.
- John saw chalk paw prints on the living room rug.
- Fido loves "Bark" dogfood.

Fido is a champion ball catcher!

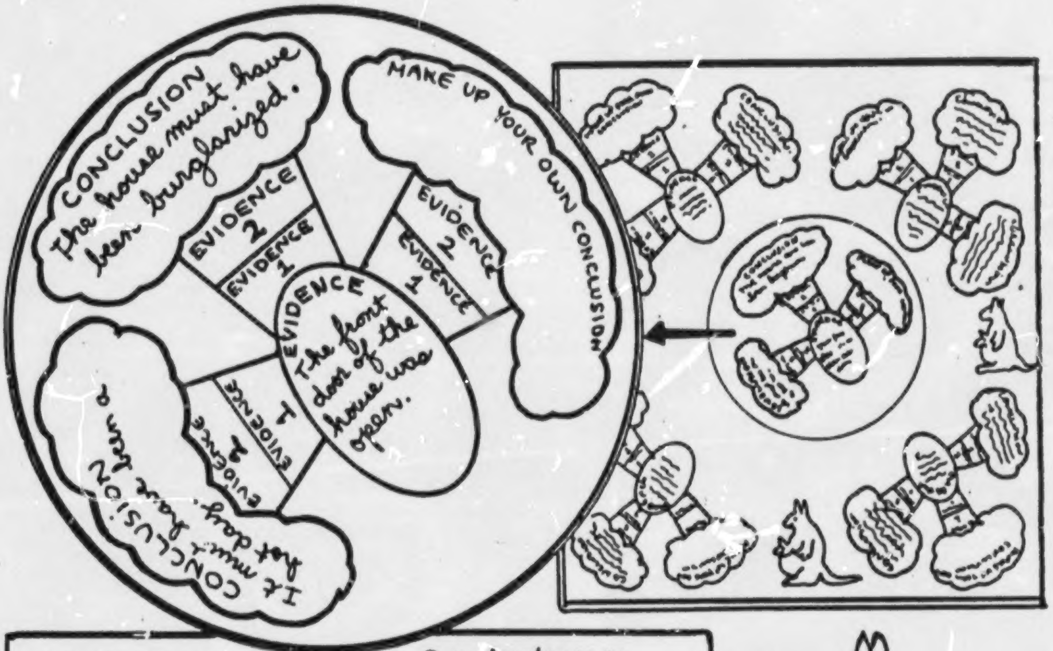
CASE #__ NAME __
Charge:
Guilty:
The evidence is:

CASE #3 NAME Jina
Charge: Fido stole the baseball.
Guilty:
The evidence is:
a ball was found in Fido's doghouse.
Not Guilty:
There is no evidence about:
what kind of ball was found.

DON'T JUMP TO CONCLUSIONS

skills: *developing evidence to support a given conclusion*
developing conclusions related to given evidence

Make the gameboard and kangaroo pieces out of heavy cardboard. The players need to listen to each other's evidence in order to verify, negate, or question its relationship to the conclusion.



CONCLUSION The house must have been burglarized.

EVIDENCE The front door of the house was open.

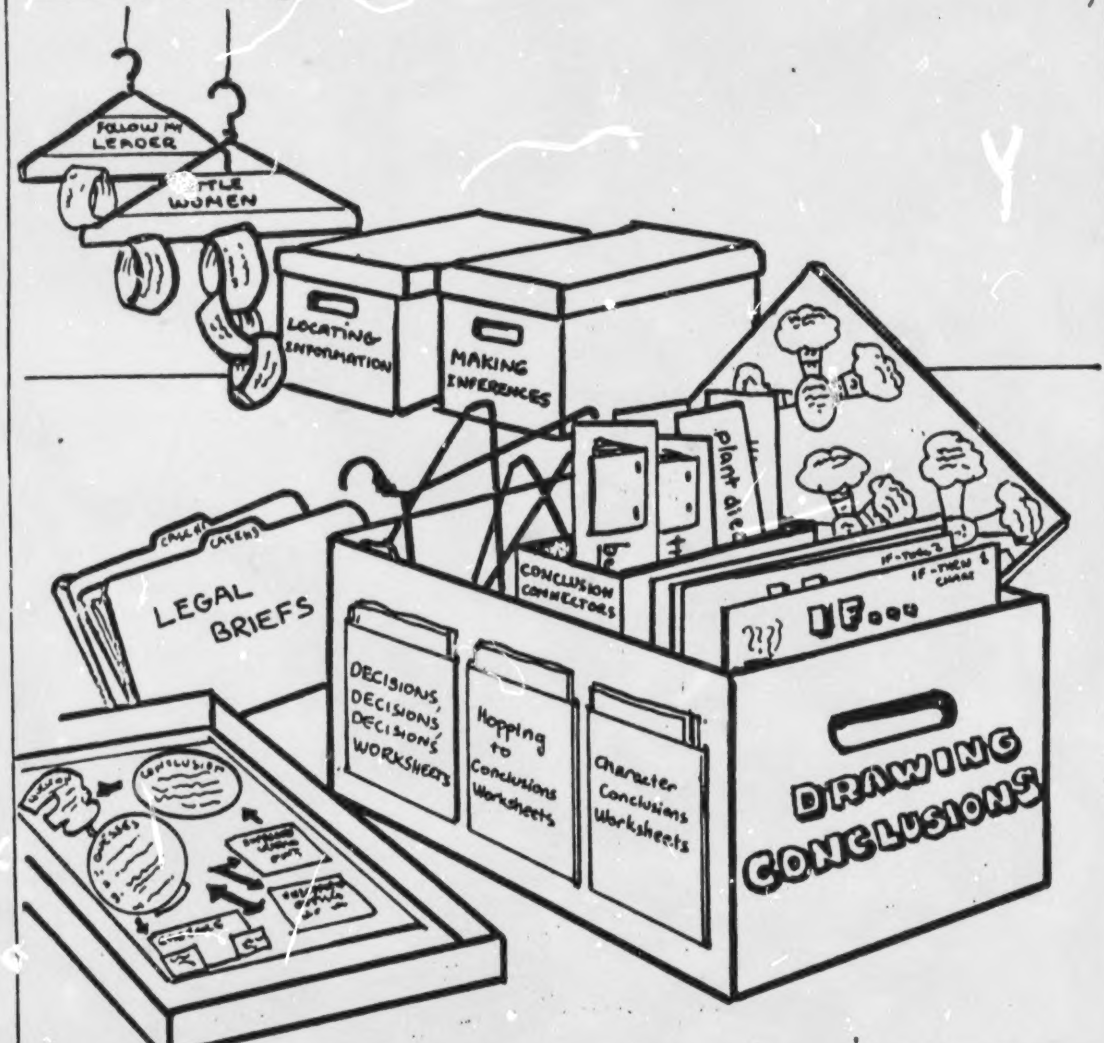
CONCLUSION It must have been a hot dog.

DIRECTIONS: 2 to 4 players

1. "Hop" a kangaroo to a grove of trees.
2. Read the evidence in the circle at the base of the trees.
3. Move to one of the two conclusions, or make up one.
4. Give (orally) two more pieces of evidence that would support the conclusion selected.

LEARNING CENTER

Housing all materials in a large box provides a learning center that is compact, movable, and easy to store. This is especially useful for teachers who share rooms, have small classrooms, team teach, or move between classrooms or schools during the day.

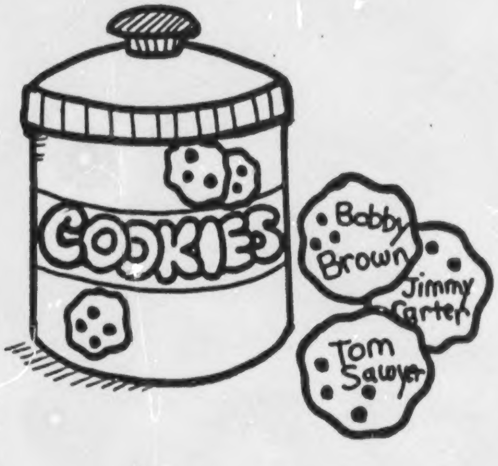

FOLLOW MY LEADER
LITTLE WOMEN
LOCATING INFORMATION
MAKING INFERENCES
plant diet
CONCLUSION CONNECTORS
IF-THEN CHART
IF...
CASES
LEGAL BRIEFS
CONCLUSION
DECISIONS, DECISIONS, DECISIONS WORKSHEETS
Hopping to Conclusions Worksheets
Character Conclusions Worksheets
DRAWING CONCLUSIONS

GROUP WORK

WHO STOLE THE COOKIES FROM THE COOKIE JAR?

skill: developing evidence to support a conclusion

Use a real cookie jar or decorate a coffee can to resemble a cookie jar. Cut out paper cookies and label each one with the name of a child in the class, a story character, or a famous person. Draw one to four chocolate chips on each cookie. One child takes a cookie from the jar and, without showing it to the others, gives the same number of clues (evidence) as there are chocolate chips. The others try to conclude from the clues whose name is on the cookie.

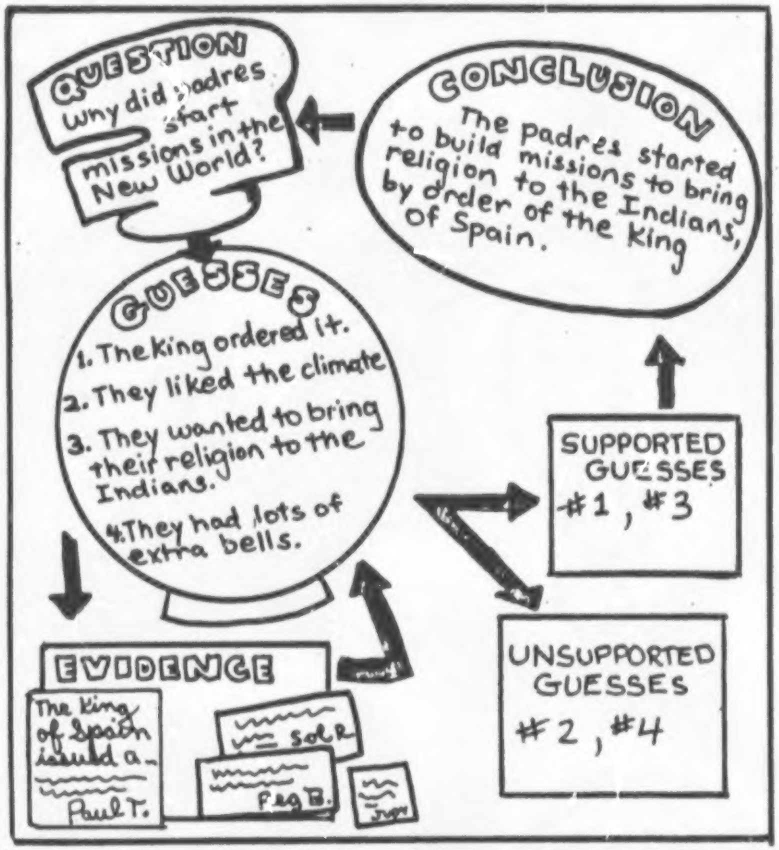

COOKIES
Bobby Brown
Jimmy Carter
Tom Sawyer

GROUP WORK

CHART TALK

skills: locating evidence to support tentative conclusions
researching

Outline the flow chart on cardboard and laminate so it can be reused. Write in a question and have children respond with guesses before doing research. After collecting data, children write down any evidence that relates to the question and attach it to the chart. The original guesses are re-evaluated in terms of the evidence. Guesses that are not supported by the evidence are rejected; those that are supported by evidence are incorporated into a conclusion that answers the question.

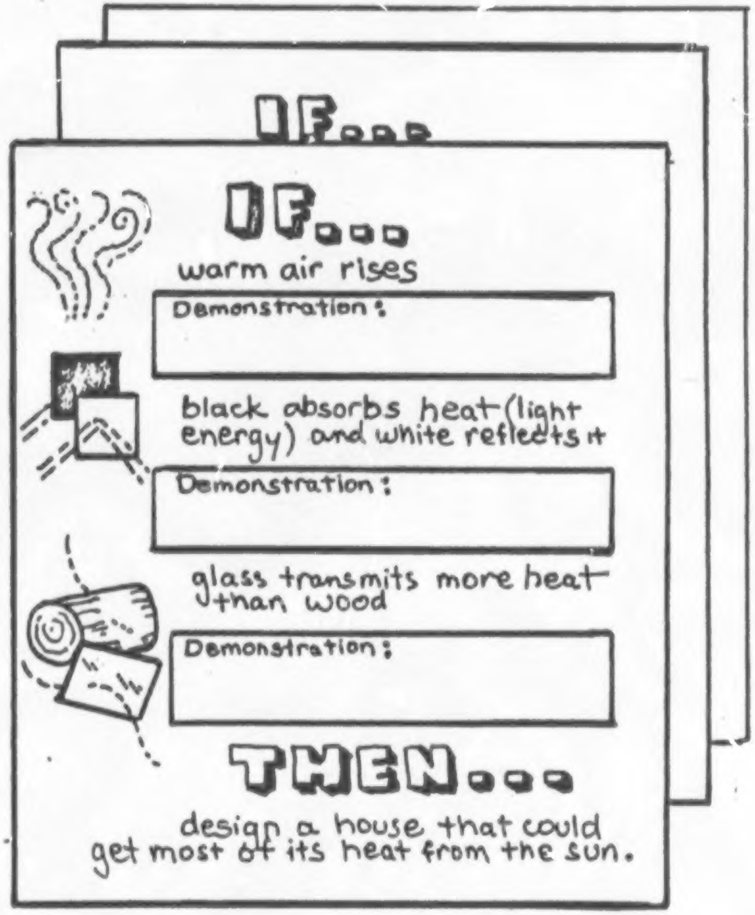

QUESTION
Why did padres start missions in the New World?
CONCLUSION
The Padres started to build missions to bring religion to the Indians, by order of the King of Spain.
GUESSES
1. The king ordered it.
2. They liked the climate
3. They wanted to bring their religion to the Indians.
4. They had lots of extra bells.
SUPPORTED GUESSES
#1, #3
UNSUPPORTED GUESSES
#2, #4
EVIDENCE
The king of Spain issued a
Paul T.
Sol R.
Peg B.

INDEPENDENT STUDY

IF/THEN CHART

skill: applying conclusions to a new situation

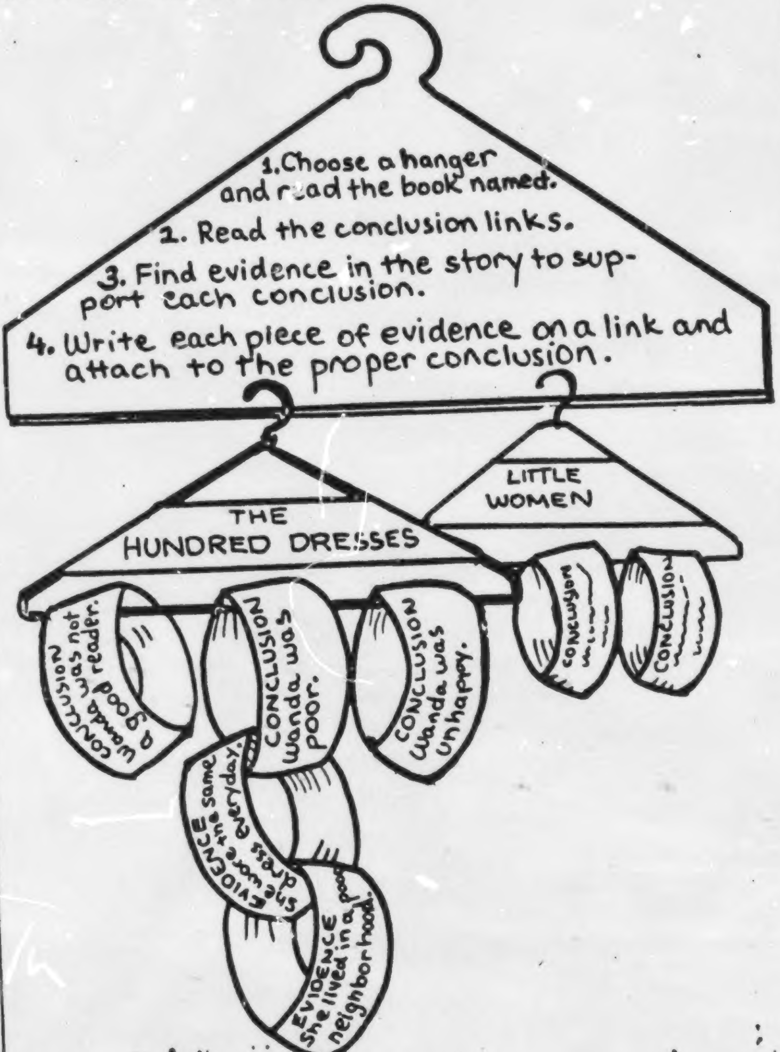
Make several IF/THEN charts. The children may devise their own way to demonstrate the "IFs" or they may be directed to science books or other sources for suggestions on demonstrations.


IF...
IF...
warm air rises
Demonstration:
black absorbs heat (light energy) and white reflects it
Demonstration:
glass transmits more heat than wood
Demonstration:
THEN...
design a house that could get most of its heat from the sun.

INDEPENDENT STUDY

CONCLUSION CHAINS

skill: locating evidence to support a conclusion

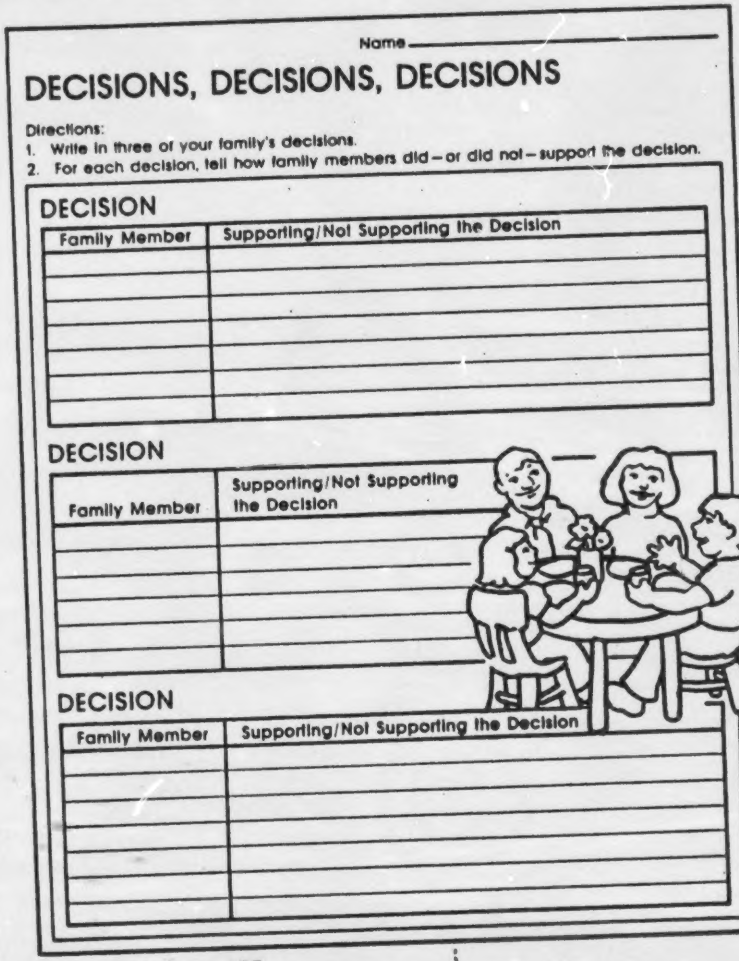

1. Choose a hanger and read the book named.
2. Read the conclusion links.
3. Find evidence in the story to support each conclusion.
4. Write each piece of evidence on a link and attach to the proper conclusion.
THE HUNDRED DRESSES
LITTLE WOMEN
CONCLUSION Wanda was not a good reader.
CONCLUSION Wanda was poor.
CONCLUSION Wanda was unhappy.
CONCLUSION
CONCLUSION
EVIDENCE She wore the same dress everyday.
EVIDENCE She lived in a poor neighborhood.

INTEGRATING WITH THE REAL WORLD

DECISIONS, DECISIONS, DECISIONS WORKSHEET

skill: identifying evidence used in making decisions

Children complete their worksheets at home. In the classroom, ask them to describe how decisions are made in their families.



Name____________________

DECISIONS, DECISIONS, DECISIONS

Directions:

1. Write in three of your family's decisions.
2. For each decision, tell how family members did—or did not—support the decision.

DECISION

Family Member	Supporting/Not Supporting the Decision

DECISION

Family Member	Supporting/Not Supporting the Decision

DECISION

Family Member	Supporting/Not Supporting the Decision

Reproducible, page 187.
Solution, page 203.

Sequential Development in Reading

41

FIRST GRADE

Readiness:

1. *Centers of Interest*:
   Home, play, pets, toys
2. *Auditory perception*:
   - a. Identifying sounds from surroundings
   - b. Identifying initial consonant sounds
   - c. Identifying words that rhyme
   - d. Listening to rhymes and songs
3. *Visual discrimination*:
   - a. Recognizing likeness and differences in shapes, color, size
   - b. Recognizing word symbols
4. *Kinesthetic development*:
   - a. Development of muscular co-ordination
   - b. Development of eye, motor, and voice co-ordination
   - c. Left to right progression
   - d. Holding book
5. *Comprehension and interpretation*:
   - a. Reading pictures
   - b. Story sequence
   - c. Making comparisons
   - d. Noticing details
   - e. Following directions
   - f. Classifying ideas
   - g. Anticipating what happens (What do you think will happen?)
   - h. Making inferences (What did the boys do to the ball?)

Pre-Primer:

1. *Centers of Interest*:
   Pets, toys, home, play
2. *Vocabulary growth*:
   - a. Concept of printed symbols
   - b. Extension of word meanings
   - c. Use of picture, context and configuration clues
   - d. Capital and lower case letters in words
   - e. Recognition of words in isolation
   - f. Using *s* plural forms of nouns and verbs

   Phonetic skills:
   Auditory and visual perception of initial consonants and rhyming words.
3. *Kinesthetic development*:
   - a. Muscular co-ordination
   - b. Eye, motor, voice co-ordination
   - c. Left to right progression
   - d. Coloring, painting, drawing, clay
   - e. Handling books
4. *Comprehension and interpretation*:
   - a. Picture reading
     What is in the picture?
     What are they doing?
     Why is the little girl excited, or sad?
     What do you think the man is saying?
     Color of clothing, hair, eyes, surroundings.
     What time of year is it? How do you know? etc.
   - b. Following directions
     Draw a house ....
     Print directions on strips as "Go to the door."
   - c. Sentence comprehension (match picture and sentence)
     "Read the sentence that says ...."
   - d. Paragraph comprehension
     Children find and read the phrase or paragraph that tells: e.g. The size of the ball (page 12).
   - e. Finding the main idea
   - f. Perceiving story sequence
     What was the first thing that happened? What happened next?
   - g. Noting and remembering details.
     Compare pictures on right and left side of book.
     Close book and think of the things Mary saw., etc.
   - h. Clarification and enrichment of meaning.
     Use pictures and dramatization to develop concepts.
     Real and vicarious experiences
     What have you seen or felt that is like this?
   - i. Making inferences
     This is so because ....
   - j. Identifying the characters.
     What word tells the name of the girl in the story?
     What kind of a girl is she? Why does she do this? How old?
   - k. Recall of events.
     Who ran to meet Mary? What do you think they planned to do?
   - l. Recognizing relationships
     Place first sentence in chart. Children find one

of remaining three sentences that go with first.
Relationships of time, cause and effect, etc.

m. Classification
   Put similar objects in same classifications.
   Lists on board or worksheets, classify pictures.
n. Anticipating outcomes
   Do you think Jack will find the dog? etc.
o. Making comparisons
   How are these the same? Different?
   Comparison of phrases, e.g. a ball — the ball
p. Locating phrases, sentences or words
   Child reads sentences. Show sentence card for each sentence read. Another child reads the sentence on the strip and tells if it is the same as the one read by child from the book.

   Write sentences on the blackboard. Read aloud a phrase in one of them. A child finds the phrase, frames it and underlines it.

   Show the word *ball*. The children find the word in a sentence in the book. A child reads the sentence he finds. Children use words in their own sentences.
q. Evaluating the story
   What did you like about the story?
   Could anything like this happen to you?
r. Making judgments
   What are the reasons?
s. Identifying words in context.
t. Dictionary chart
   (to be read orally.)

   Children choose parts of story they will prepare to read orally

   Title.
   Read the part that tells what Jack wanted to do.
   Read the part that tells what Mary said.
   Read the part that tells what Mary did.
   Read the two pages about Spot.

Primer:

1. *Centers of interest*:
   a. Work and play at home, play with friends.
   b. Experiences with store, zoo, farm, park, airport, etc.
2. *Vocabulary*:
   a. Developing structural analysis skills
   b. Plural ending *s*
   c. Compound words as *snowball, sunshine*, etc.

   Phonetic skills:
   a. Initial consonants, *b, c, d, g, h, l, m, n, p, r, t, w*
   b. Final consonants, *d, l, s, t*
   c. Digraphs *ch, th, wh*
3. *Comprehension and interpretation*:
   a. Phrase and sentence comprehension
   b. Finding the main idea.
   c. Perceiving story sequence.
   d. Reading for details.
   e. Recall of story facts
      Who did the following things:
      ....went up the hill. ....came to the door, etc.
   f. Perceiving relationships.
   g. Classifying ideas.
   h. Forming judgments.
   i. Making inferences.
   j. Interpretation of pictures.
   k. Using context clues.
   l. Reading for information.
      Who put out the fire? Where did Jack go? etc.
   m. Mental imagery
   n. Purposes for rereading
      Suggest another title for the story.
      Find answers to specific questions.
      Select sentences that describe pictures.
      Describe the character.
      Locate certain information.
      Find sequence of events.
      Prepare for dramatization.
      Compare two episodes.
      Reading aloud.
4. *Rules for an audience*:
   a. Listen closely.
   b. Look at the person reading.
   c. Sit quietly, etc.

First Grade:

1. *Centers of interest*:
   Neighborhood, school activities, park, stores, bus, etc.
2. *Vocabulary*:
   a. Endings of *d* and *ed* for verbs.
   b. Verbs with *ing* forms.
   c. Compound words, possessives.

   Phonetic skills:
   a. Initial consonant *dr, b, pr, st, tr*
   b. Final consonant, *nd, nk, nt, st*
   c. Recognize vowel letter forms *a, e, i, o, u*
3. *Comprehension and interpretation*:
   a. Interpreting use of punctuation marks.
   b. Making inferences.
      Can you think of something else they should do?
   c. Anticipating what will happen.
   d. Making comparisons.
   e. Finding answers.
   f. Using the contents page.
   g. Locating phrases, sentences.
      Find phrases or sentences to answer the questions
   h. Reading to evaluate.
   i. Reading to verify answers.
   j. Association of ideas.
      Words that belong together: ate....bread, hear sound, etc.
   k. Retelling stories.
   l. Opposites.

Use words in reader, e.g. cats, cow, ducks: apple, berries, etc.

- m. Classifying words.
- n. Reading to dramatize.
- o. Learning that words have different meanings. well, rock, run, box, trip, kind, etc.
- p. Locating story details.
- q. Grouping of related ideas.
- r. Verifying facts.
- s. Anticipating what will happen.

SECOND GRADE

1. *Vocabulary*:
   - a. Clarifying and extending word meanings.
   - b. Using picture and context clues.
   - c. Recognizing words of similar and opposite meanings.
   - d. Recognizing variant meanings of words.
   - e. Recognizing root forms.
   - f. Using *es* forms of nouns and verbs.
   - g. Using *er* and *est* forms of words.
   - h. Changing *y* to *i* before adding endings.
   - i. Possessives and contractions.

   Phonetic skills:
   - a. Initial consonants, final consonants.
   - b. Changing *y* to *i* before adding endings.
   - c. Consonant blends.
   - d. Long and short sounds of vowels.
   - e. Diphthongs.
   - f. Identifying silent consonants.
2. *Comprehension and interpretation*:
   - a. Phrase and sentence comprehension.
   - b. Paragraph and story comprehension.
   - c. Finding the main idea.
   - d. Reading for details.
   - e. Perceiving story sequence.
   - f. Following directions.
   - g. Perceiving relevant ideas.
   - h. Classifying and summarizing ideas.
   - i. Perceiving cause-effect relationships.
   - j. Forming judgments.
   - k. Making inferences and drawing conclusions.
   - l. Predicting outcomes.
   - m. Evaluating literary characteristics.
   - n. Discriminating between conversation and narrative.
   - o. Discriminating between fact and opinion, realism and fancy.
   - p. Locating answers to questions, locating information.
   - q. Finding proof.
   - r. Locating sentences.
     Children read aloud from their books the sentences that answer questions listed on blackboard or paper.
   - s. Using the contents page.
   - t. Descriptive words.
     List words. Children give the name of the person or thing each one describes, e.g. quiet, loud, brave, etc.
   - u. Recall of story detail.
   - v. Classifying words.
   - w. Context clues.
   - x. Anticipating what will happen.
   - y. Locating quotations.
     e.g. "I see a light in the window."
   - z. Association.
     The sun   is shining.
     The rain   is falling.   etc.

THIRD GRADE

1. *Vocabulary*:
   - a. Using meaning clues.
   - b. Recognizing words of similar and opposite meanings.
   - c. Recognizing variant meanings of words.
   - d. Recognizing shades of meaning of words.
   - e. Recognizing homonyms, synonyms, antonyms, root word forms.
   - f. Using apostrophes.
   - g. Using hyphenated words.
   - h. Using prefixes *a, be, un*.
   - i. Using suffixes *en, er, est, ful, ish, ly, y*.
   - j. Recognize syllables in words.

   Phonetic Skills:
   - a. Recognize hard and soft sound of *c* and *g*.
   - b. Final and initial digraphs and blends.
   - c. Long and short vowel sounds.
   - d. Diphthongs.
   - e. Determining vowel sounds by position in words.
   - f. Identifying silent consonants and vowels in words.
2. *Comprehension and interpretation*:
   - a. Phrase, sentence, paragraph and story comprehension.
   - b. Finding main idea.
   - c. Reading for details.
   - d. Perceiving sequence.
   - e. Recalling story facts.
   - f. Following directions.
   - g. Forming opinions, making judgments.
   - h. Making generalizations.
   - i. Noting variety in literary thinking.
   - j. Critical thinking, creative thinking.
   - k. Characteristics of folk tales, fables.
   - l. Perceiving relevant ideas. Checking comprehension and memory.
   - m. Classifying and summarizing ideas.
   - n. Verifying conclusions.
   - o. Visual imagery.
   - p. Clarifying and expanding concepts, clarifying meaning.
   - q. Unusual expressions.
   - r. Making inferences and drawing conclusions
   - s. Perceiving cause-effect relationships.
   - t. Predicting outcomes.

u. Discrimination between realism — fancy; fact — opinion.
v. Recognizing contradictory statements.
w. Recognizing organization of content materials.
x. Reference material, locating information in books, card catalog.
y. Integrating new ideas with past experience. Extending interpretation.
z. Alphabetizing.
a'. Research.
b'. Noting the use of figurative speech.
c'. Impersonations.
d'. Noting emotional aspects, noting mood.
e'. Author.

FOURTH GRADE

1. *Vocabulary*:
Continue with suggestions in previous grades.

2. *Interpretation and comprehension*:
a. Sensing broader meanings.
b. Selecting relevant ideas.
c. Skimming.
d. Alphabetizing.
e. Using diacritical marks.
f. Developing concepts of time.
g. Establishing authenticity of material.
h. Using the glossary.
i. Reading to find the general idea.
j. Making critical interpretation.
k. Locating the setting.
l. Finding proof.
m. Reading to locate information.
n. Synonyms, homonyms, antonyms.
o. Interpreting idiomatic expressions, colloquialisms, figurative speech.
p. Seeing deeper implications.
q. Clarifying ideas.
r. Applying understandings. Comparing differences between present and past.
s. Summarizing.
t. Reading to identify evidence.
u. Visualization, forming sensory images.
v. Predicting outcomes.
w. Recalling details.
x. Following directions.
y. Appreciating artistry of style.
z. Integrating new ideas with past experiences.
a'. Classifying ideas.
b'. Forming opinions.
c.' Analyzing conclusions.
d'. Interpreting colorful expressions.
e'. Understanding abstract terms.
f'. Cause and effect.
g'. Fusing ideas gained through reading.
h.' Identifying good words, prefixes, and suffixes.
i'. Using the glossary.
j'. Summarizing sequence of events.
k'. Sensing implied meaning.
l'. Making critical interpretations.
m'. Knowing compound words.
n'. Deriving meaning from context.
o'. Using syllabication principles.
p'. Judging validity of material.
q'. Outlining.
r'. Finding informational details

FIFTH AND SIXTH GRADE

1. *Comprehension and interpretation.*
a. Finding the main idea.
b. Making comparisons.
c. Outlining.
d. Learning about the author.
e. Classifying terms.
f. Distinguishing syllables.
g. Fusing ideas gained through reading.
h. Using table of contents, section title.
i. Indexing.
j. Matching words with meaning.
k. Heteronyms—a tame dove—dove into woods.
l. Forming opinions.
m. Association of ideas.
e.g. charm—something worn to keep away ill fortune.
n. Appreciation of style.
o. Alliteration. e.g. each word in sentence begins with same letter.
p. Figurative speech.
q. Critical thinking.
r. Making comparisons.
s. Seeing deeper implications.
t. Reading to answer specific questions.
u. Analysing conclusions.
v. Knowing about authors.
w. Matching ideas and paragraphs.
x. Skimming to find details.
y. Drawing conclusions.
z. Noting character traits.
a'. Drawing inferences.
b'. Verifying statements.
c'. Finding the climax; determining the plot.
d' Summarizing.

1. Sequence of Events

Grades five and six

Discuss the use of certain words in learning the sequence of events. There are certain words, called qualifying words, that can help the student discover the sequence more easily. Some of the words are *first, then, next, in the meantime, when, while, after that, and then, at last,* and *finally.*

If the students know when the story took place, whether it was yesterday, ten years ago, or a hundred years ago, they will understand the selection better. Customs and ways of living change, and if they know the people they are reading about lived a hundred years ago, they will know why they acted, talked, lived, and dressed as they did.

Usually the reader can follow the sequence of events without too much difficulty. The author usually tells each thing in the order that it happens. It is like stringing beads on a thread. When the beads are all strung, you can see the pattern of the beads plainly.

However some writers do not make it that easy. They skip from one thing to another and it takes careful reading to follow the correct sequence.

Exercises in making time charts in social studies may prove to be a valuable activity in developing awareness of the sequence of events.

2. Finding the Sequence

Grades five and six

Prepare stories that have established sequences and ask the students questions pertaining to them.

Example: In 1920, the New York Fair opened; Joe Brown had just finished painting the sign for his ice-cream parlor, and he felt that he had picked the right spot because the people who were on their way to the Fair, or on their way out, would pass by his little place.

More and more people stopped to buy ice-cream sandwiches, and Joe and his sister were kept very busy making sandwiches by spreading ice-cream between waffles. There was no competition for them, and they felt very fortunate.

Then one day, they noticed some men putting up a building across the street. Then they saw a sign go up, "Ice-Cream Palace." Joe and Rose were afraid they were going to lose some of their business to the new place.

That same day, Joe brought Rose a small bunch of flowers. Rose wondered where she could put the flowers, and then her eyes fell on a waffle. Rose rolled the waffle into a cone and put a little water in it.

Rose didn't want to waste the other half of the waffle so she rolled it into a second cone and put some ice-cream into it and ate it. Here was a new idea! And it would take less waffles to make their ice-cream sandwiches if they used just a half a waffle and rolled it into a cone!

They began calling their new idea "ice-cream cones" instead of ice-cream sandwiches. The cones were talked about by everyone at the New York Fair. The people liked them much better than sandwiches because the ice-cream did not drip out of them.

The Ice-Cream Palace across the way began having fewer customers, and so the man who owned it stopped by to see Joe one afternoon. He said it was the ideas that count if you plan to succeed.

a. Underline the words that helped you find the proper order of events.
b. How long did this event take place? ....
c. What words are not used very often today? ....
d. How much do you think the ice-cream cones cost at that time? ....
e. What is the meaning of the word *competition?* ....
f. What is the opposite of *fortunate?* ....

Skills in Reading

It is important that children learn to develop the various reading skills in order to read effectively. The skills listed below can be developed through the suggested activities given in this book.

I. SKILLS IN WORD RECOGNITION

1. Context clues (meaning from sentence)
2. Configuration (look at shape of word)
3. Structural analysis (roots, prefixes, syllables, base words, compounds)
4. Phonetic analysis (sound elements)
5. Dictionary usage (final answer)

II. SKILLS OF MEANING (Comprehension and Interpretation)

1. Get central idea of selection
2. Study organization
3. Use mental imagery (wire for sound – color)
4. Relating ideas in own words
5. Characterizing
6. Judging
7. Inferring
8. Generalizing
9. Predicting
10. Skills of oral interpretation
11. Making conclusions
12. Proving conclusions
13. Reflective thinking
14. Seeing relationships
15. Listing ideas in sequence
16. Application – solving and constructing
17. Organize facts to support a conclusion
18. Associate related ideas
19. Identify important and unimportant details
20. Relate to own experiences
21. Read between the lines

III. STUDY SKILLS

1. Finding and selecting information for specific questions or problem
2. Organizing (topic sentence, main and subpoints)
3. Locating information
   a. Different types of books
      ....textbooks, encyclopedias, atlas, yearbooks, bound volumes
   b. Library
      ....card catalog
      ....Reader's Guide
   c. Parts of book
      ....table of contents
      ....index and glossary
      ....maps, charts, graphs
      ....topical headings
      ....copyright page to determine recency
      ....footnotes
   d. Dictionary
      ....use guide words at top of dictionary page
      ....abridged and unabridged
4. Following directions
5. Retaining and remembering
6. Skimming to find the answer

IV. SKILLS OF APPRECIATION

1. Appreciating types – poetry-prose, new, old, factual, political, humorous, argumentative, fictional
2. Style-manner of speech, period written, rhythm, visual clarity, words used
3. Quality – truth of life, author's purpose, fundamental honesty, factual

V. RETENTION OF IDEAS

1. Choose ideas to remember
2. Express accurately
3. Summarize
4. Outlining

VI. EVALUATION

1. Judging statements of importance
2. Evaluate for completeness, organization, clarity, style
3. Study guide words
4. Check printed statement
5. Difference between fact and opinion
   Use of clue words: "It has been reported," "Many people believe"
6. Examine your impression as a whole
7. Evaluate accuracy of author's logic

Types of Reading

46

I. **Developmental Reading**
  1. Vocabulary development
    ....through context
    ....structural analysis
    ....phonetic analysis
    ....dictionary
  2. Comprehension and interpretation
    ....grasping inferred ideas
    ....recognizing fact or opinion
    ....interpretation of ideas
    ....visualizing content
  3. Evaluating and organization
    ....drawing and proving conclusions
    ....classifying
    ....choosing main idea and supporting details
    ....relating associated ideas
    ....summarizing
    ....outlining
  4. Retention
  5. Oral reading abilities
    ....enunciation and pronunciation
    ....fluency
    ....interpretation
  6. Mechanical make-up of book
  7. Appreciation

II. **Work Type Reading**
  1. Interpretation
  2. Locating information
  3. Following directions
  4. Use of workbooks; exercise sheets; contracts
  5. Read to find the answer
  6. Read to help solve problems

III. **Functional Reading**
  1. Development of ability in content fields
  2. Technical vocabulary
  3. Graphs, charts, maps, etc.
  4. Development of units of work
  5. Finds answers — solves problems

IV. **Assimilative Reading**
  1. Children make their own
    ....charts, posters, scrapbooks, stories, etc.

V. **Recreatory or Independent Reading**
  1. Read for pleasure and enjoyment
  2. Extension of experiences
  3. Escape or fantasy
  4. Materials easy and well illustrated
  5. Bulletin boards
  6. Contract reading
  7. Library experience

VI. **Critical Reading**
  1. Evaluation
  2. Selection
  3. Find specific purpose
  4. Formulation of opinions
  5. Organization of ideas

VII. **Locational Reading**
  1. Ability to locate information
  2. Skimming for certain facts.

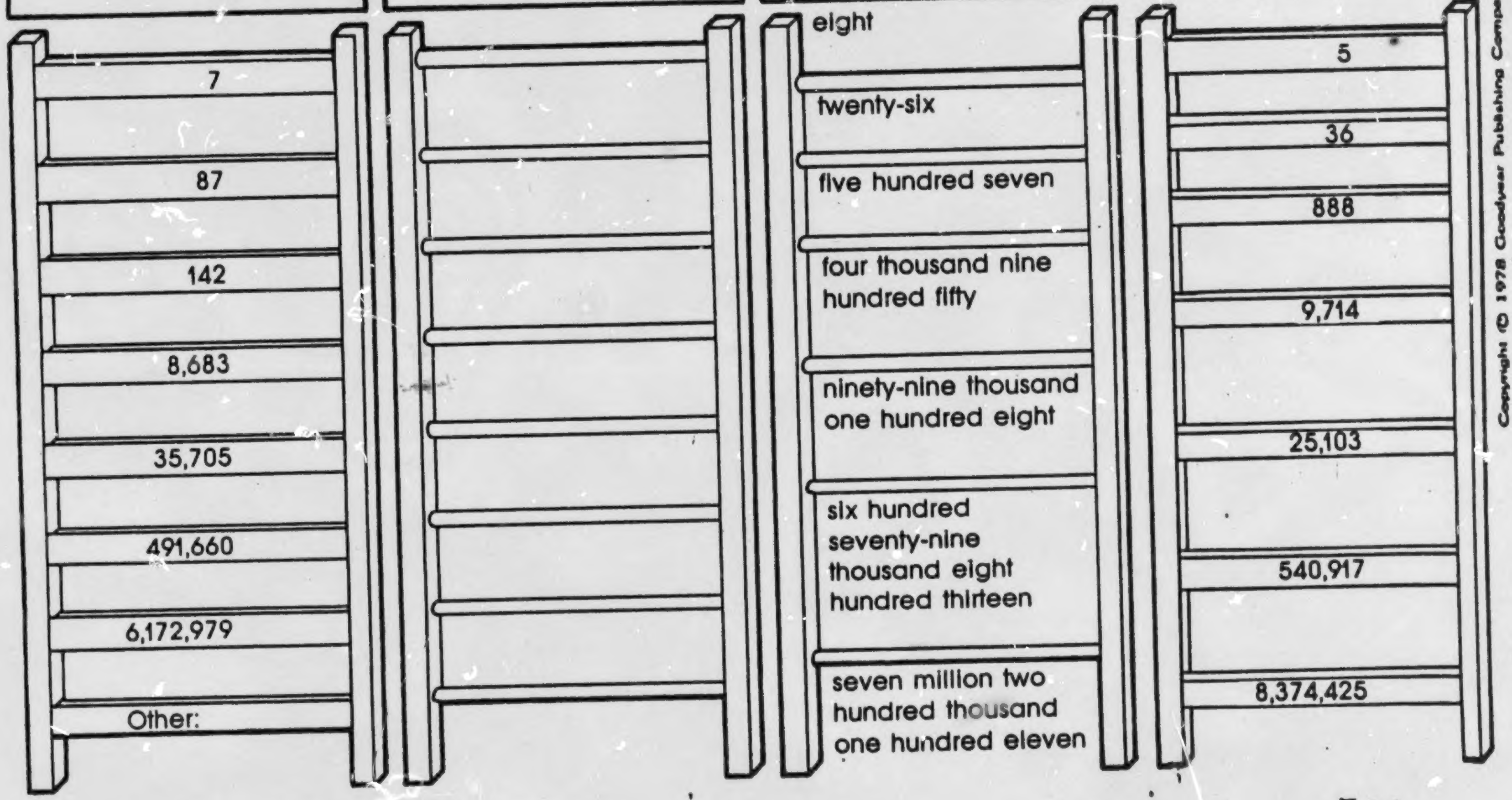
VIII. **Selective Reading**
  1. Children read graded material at instructional level
  2. Teacher evaluates reading

Name ____________________

READING AND WRITING NUMERALS

To do with the teacher:
The teacher will check the numerals as you read them from the first ladder.
A new set of numerals will be dictated for you to write on the second ladder.

To do by yourself:
Complete these tasks by yourself.



READING NUMERALS

- 7
- 87
- 142
- 8,683
- 35,705
- 491,660
- 6,172,979
- Other:

WRITING NUMERALS

READ THE WORDS AND WRITE THE NUMERALS IN THE SPACES

- eight
- twenty-six
- five hundred seven
- four thousand nine hundred fifty
- ninety-nine thousand one hundred eight
- six hundred seventy-nine thousand eight hundred thirteen
- seven million two hundred thousand one hundred eleven

READ THE NUMERALS AND WRITE THE WORDS IN THE SPACES

- 5
- 36
- 888
- 9,714
- 25,103
- 540,917
- 8,374,425

Copyright © 1978 Goodyear Publishing Company

"Reading and Writing Numerals," page 7; Solution, page 192.

SENTENCE EXPANDER

Name ______________________________

Example:

Expand sentences.
You can expand sentences.
You can expand sentences
to make them more interesting.

Directions:
Read sentence 1 in part A. In the empty boxes write two words to tell what kind of monster.
In sentence 2, the new words you add will tell what kind of boy.
In sentence 3, your new words will tell where the monster was or what the monster was doing.
Expand the sentences in parts B and C, just like you did in part A.

A

1 The boy saw a ___ ___ (what kind of?) monster.
2 The ___ ___ (what kind of?) boy saw a ___ ___ (words from sentence 1) monster.
3 The ___ ___ (words from sentence 2) boy saw a ___ ___ (words from sentence 1) monster ___ ___ ___ (where? or doing what?).

B

1 The sun came up ___ ___ (where or when?).
2 The ___ ___ (what kind of?) sun came up ___ ___ (words from sentence 1).
3 ___ ___ (when? or where?) the ___ ___ (words from sentence 2) sun came up ___ ___ ___ (words from sentence 1).

C

1 People are funny.
2 ___ (what kind of?) people are ___ (how?) funny.
3 ___ (what kind of?) people are ___ (word from sentence 2) funny ___ ___ ___ ___ ___ (why?).

"Writing Sentences," page 39; Solution, page 196.

PARTS OF SPEECH

To the teacher:
Write in an appropriate sentence.

DIAGNOSTIC SENTENCE: ____

____

Have each student read the sentence. Then ask the child to point out a noun, tell what a noun does, and give several examples of other nouns. Check for understanding of other parts of speech in the same manner.

		NOUN			ADJECTIVE			VERB			ADVERB			OTHER		
STUDENTS' NAMES	DATE	Identifies in context	Defines purpose	Gives new examples	Identifies in context	Defines purpose	Gives new examples	Identifies in context	Defines purpose	Gives new examples	Identifies in context	Defines purpose	Gives new examples	Identifies in context	Defines purpose	Gives new examples

Copyright © 1978 Goodyear Publishing Company

"Parts of Speech," page 49.

Name ____________________

PARTS-OF-SPEECH DOMINOES

Directions:

1. Cut out the word dominoes.
2. Paste them in the space below in a domino pattern. The sides of the dominoes that touch must be the same part of speech—noun, verb, adjective, or adverb.
3. *On the blank half of any domino write in a word to make the parts of speech match.

START HERE: big | sing

swim		tree		gaily	
	blue	sun		down	
very		man		that	

*"Parts of Speech," page 50; Solution, page 198.

Copyright © 1978 Goodyear Publishing Company

"Main Idea/Summarizing," page 67; Solution, page 200.

MAIN IDEA

Name ____________________

I. Fill in the bubble that names the letter of the topic sentence.

A B C D E
○ ○ ○ ○ ○

A There are many different kinds and locations of homes. B Some homes are small. C Some homes are big. D Some homes are near the city. E Where do you live?

II. ✓ the number that matches the topic sentence.

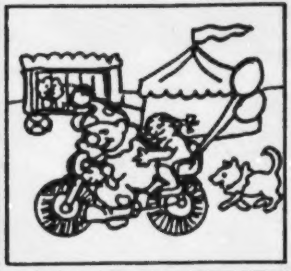
___1 ___2 ___3 ___4

[1] The rose is a flower that is often used for corsages. [2] The chrysanthemum is a flower that is eaten. [3] Some flowers are used to make teas. [4] Flowers are used for a variety of purposes.

III. Write the letter that names the topic sentence. ________

a Cinderella was crying. b Her stepsisters were angry. c Everyone in the house was upset. d The cat was running around. e The dog was barking.

IV. Write or tell your teacher the main idea of the picture in your own words.



____
____
____
____
____
____

V. Write the main idea of the story in your own words.

____
____
____
____
____
____
____

Mary had a dog as a pet. They played together. They watched TV together. They went everywhere together.

VI. List the key words of the paragraph below. ____________________

____
____
____

Names of fish often give clues to their many different shapes and colors. There are yellow-tail tunas and pink salmon. Can you guess the shapes of the pipefish and the hammerhead shark?

To the teacher:
Check the appropriate column to indicate the student's performance on these main-idea exercises.

	ITEM	RESPONDED APPROPRIATELY	NEEDS PRACTICE
	Locates topic sentence in context (I, II, III)		
	States main idea from picture or paragraph (IV, V)		
	Identifies key words (VI)		

Copyright © 1978 Goodyear Publishing Company

PREFIXES AND SUFFIXES

Assess the children in a group activity, such as Pass the Hat (page 65), in the following way:

⧄ not introduced to skill

◩ working on the skill

■ mastery of the skill

STUDENTS' NAMES	Identifies prefixes in words	Defines prefixes	Gives words containing prefixes	Defines words containing prefixes	Uses words containing prefixes in a sentence	**Knows these prefixes:**	Identifies suffixes in words	Defines suffixes	Gives words containing suffixes	Defines words containing suffixes	Uses words containing suffixes in a sentence	**Knows these suffixes:**
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	
	⧄	⧄	⧄	⧄	⧄		⧄	⧄	⧄	⧄	⧄	

Copyright © 1978 Goodyear Publishing Company

5[illegible]8

509

"Prefixes and Suffixes," page 61.

ANNEX B

VOLUNTEER-MADE MATERIALS

(GROUP C)

S	M	T	W	Th	F	S
January 24	25	26	27	28	29	30
31	February 1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	March 1	2	3	4.	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31.			

ARALEN SUNDAYS

S	M	T	W	Th	F	S
April	ARALEN SUNDAYS			1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	may 1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29 515
514 30	31	June 1	2	3	4	5
6	7	8	9	10	11	12